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An Evaluation of the New Jersey Health Information Technology (Health IT) Program:

E-Prescribing, Electronic Lab Orders/Results Delivery, and Physician Use of EHRs, Participation in Regional HIOs, and Use of Electronic Clinical Summaries

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April 14, 2014

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Acknowledgments

Funding for this project was provided through the New Jersey Department of Health, New Jersey Health Information Technology (Health IT) Coordinator's Office that was funded through the Office of the National Coordinator for Health IT (ONC). We are grateful for valuable comments on the design and content of this study by Joel Cantor, CSHP Director, Eileen Troutman, Acting NJ Health IT Coordinator, Wilbur Briones, Consultant, and representatives of NJ-HITEC and NJ's regional Health Information Organizations (HIOs). We also thank Miriam Bolger, Health IT Project Manager, NJ Health Care Facilities Financing Authority, for providing the HIO Use Metrics. In addition, we thank the NJ physicians, pharmacists, and clinical laboratory managers who agreed to be interviewed for this project and provided valuable feedback. Finally, we thank CSHP colleagues Bram Poquette, M.L.I.S., for his contributions in formatting this report, Kristen Lloyd, M.P.H., for her editorial comments, and Alexandria Kircher for assistance with data collection.

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Executive Summary

The Health Information Technology for Economic and Clinical Health Act (HITECH Act) was enacted under Title XIII of the American Recovery and Reinvestment Act (ARRA) which was signed into law by the president on February 17, 2009 (One Hundred Eleventh Congress of the United States of America 2009). Under the HITECH Act, the United States Department of Health and Human Services is spending approximately $32 billion to promote and expand the adoption of health information technology (health IT) for the electronic sharing of clinical data among hospitals, physicians, and other health care stakeholders (Redhead 2009). Eligible physicians who adopt, implement, upgrade, or demonstrate "meaningful use" of certified EHR technology can receive a maximum of $44,000 through Medicare and up to $63,750 through Medicaid over five continuous years in the program (CMS 2014). As of December 2013, approximately $6.6 billion has been distributed in incentive payments to 323,293 eligible professionals overall and about $180.5 million to 10,862 eligible professionals in New Jersey (CMS 2013a, 2013b).

As a requirement of the ARRA funding received by NJ, an independent evaluation of the state's health IT program was mandated. The areas to be evaluated include three key health IT use criteria: (1) e-prescribing by pharmacies and physicians, (2) electronic lab results by laboratories and physicians, and (3) use of patient care summaries by physicians, and to also evaluate NJ physician participation in regional health information organizations (HIOs). In order to comply with this requirement, the NJ Health IT Coordinator's Office engaged the Rutgers University Center for State Health Policy (CSHP) to complete a series of multi-method analytic activities to inform the evaluation of health IT implementation in the State. As part of that work, CSHP conducted and analyzed a physician mail survey, clinical laboratory and pharmacy mail surveys with telephone follow-up, and physician follow-up telephone interviews with fax and mail

follow-up in late 2013 to early 2014. In addition, HIO Use Metrics from each of NJ's six regional HIOs were collected from the NJ Department of Health and analyzed by CSHP researchers. Findings converged in several key themes across all data components.

Chapter 1 of this report covers the use of electronic-prescribing (e-prescribing) and includes findings from a survey of non-e-prescribing pharmacies (N=19) and relevant items from the physician survey (N=958).

- Key findings from the non-e-prescribing pharmacy survey:
    - The leading factors for non-participation in e-prescribing were financial burden on the pharmacy (start-up and maintenance costs, prescription transaction fees), bugs in the systems, low rate of e-prescribing adoption by area physicians, and lack of knowledge about how e-prescribing works and the benefits of implementation in improving workflow and care coordination.
    - Pharmacies believed that implementation would either not impact or might help in streamlining workflow, reducing processing time for patients, improving turn-around time, decreasing callbacks to physicians, misplaced prescriptions, and increasing access to patient medication history.
        - It may or may not improve the ability to track patient medication adherence and communication with the physician, but many believed that it would not impact the communication and overall relations with the patient.
    - Most pharmacies were not aware of the existence of HIOs in their area and were not interested in participating in HIOs to exchange information.
    - The responding pharmacies were mainly independent or alternate dispensing sites and the majority of them were not planning to implement e-prescribing in the future.
        - Half of the pharmacies were located in areas where the physician adoption rate of e-prescribing is low.
        - An increase in demand as more physicians start e-prescribing could act as a driving force for these pharmacies to begin accepting e-prescriptions.
    - Some respondents shared interest in getting more information about e-prescribing and how it works.
- Key findings from the physician survey related to e-prescribing:
    - Nearly three-fourths (72.5%) of physicians are currently transmitting prescriptions to pharmacies electronically.
        - Of these, about a quarter (26.9%) implemented e-prescribing before 2010; implementation increased steadily from 2010 to 2012, with a slight drop-off in 2013.

- Among those currently e-prescribing, the vast majority (74.0%) use e-prescribing for at least 60% of all their prescription orders.
- The most common method of e-prescribing is via an office EHR system (84.0%). Most of the remaining (15.9%) use an external web portal.
- Physicians ages 70 and over, solo physicians and those in very large practices, and specialist physicians are significantly less likely to transmit prescriptions to pharmacies electronically.

- Among those physicians not currently e-prescribing, nearly 80% plan to implement e-prescribing within the next two years.
- The main reasons for not adopting e-prescribing included start-up and maintenance costs of the system, physician skepticism regarding the benefits of e-prescribing, and low use of prescribing in their specialty.
- Across most measures, a large majority of physicians felt that e-prescribing would have a positive impact on their practice (66.8% to 77.8%).
  - This was especially true for information availability (77.8% reported a positive impact), report accuracy (76.8%), and patient safety (72.5%).
  - The exceptions were the impact of e-prescribing on overall healthcare costs, where only 40.7% thought e-prescribing would have a positive impact, and on the patient-doctor interaction (47.1% positive).
- For implementing or expanding e-prescribing in their practice, start-up financial cost was the top barrier cited, with 42.2% of physicians saying it was a major barrier and another 31.4% said it was a minor barrier.
  - This was closely followed by technical limitations of systems, lack of uniform standards within the industry, ongoing financial costs, and training and productivity loss.
  - Privacy or security concerns and physician skepticism were rarely cited as major barriers.
- Physicians ages 70 and over, solo physicians and those in very large practices, and specialists were significantly less likely to transmit prescriptions to pharmacies electronically.
  - Primary care physicians were more likely to send 60% or more of their prescriptions electronically to a pharmacy.
- For the main reason for not adopting e-prescribing, younger physicians, large practice sizes (6 or more physicians), and specialists were less likely to e-prescribe due to the minimal use of prescribing generally in their specialty.
  - Older physicians (with the exception of physicians 70 and over), smaller practices, and primary care physicians were more likely to report financial cost of the system as the main reason for not e-prescribing.

- Primary care physicians, younger physicians, and larger practices were more likely to report a positive impact of e-prescribing on their practice.
- Across most barrier measures, older physicians were more likely and larger practice sizes were less likely to report beginning or expanding e-prescribing as a minor or a major barrier for their practice.
    - Physician skepticism and lack of time to acquire knowledge about systems were more likely to be reported as major barriers by solo physicians.
    - Primary care physicians were less likely to report lack of time to acquire knowledge about systems, low participation by area labs, and technical limitations of the systems as major or minor barriers.

Chapter 2 covers the use of electronic lab requests/results delivery and contains findings from analysis of a survey of hospital and independent clinical labs (N=76) and relevant items from the physician survey (N=958). Topics of interest were analyzed by key descriptive measures for both labs (laboratories that do or do not accept lab orders electronically and laboratories that do or do not send results electronically to an ordering health care provider) and physicians (age, practice size, primary specialty groups; to be included in final report).

- Key findings from the clinical lab survey:
    - Sixty-seven percent of labs reported that providers are able to order lab tests electronically. The majority (86.7%) of labs are capable of sending test results electronically in a structured format.
    - The most common barriers to accepting electronic lab orders were financial burden (installation and operating costs) and a limited number of healthcare providers with the capability to place electronic lab orders.
    - Among the 32% of labs that lack the capability to accept electronic lab orders, over half have an implementation plan.
    - The major barriers to implementing electronic reporting of laboratory results were financial burden (subscription rates for exchange service providers) and lack of harmonization of industry accepted standards.
    - Among the 13% of labs that were not capable of sending test results electronically, 80% have an implementation plan.
    - Overall, the perceived impact of electronic lab order and electronic delivery of laboratory results was positive. The technology-related skill in greatest need was laboratory persons who bridge knowledge between IT and lab.
- Key findings from the physician survey related to electronic lab requests/results delivery:

- Nearly two-thirds (62.6%) of NJ's physicians are currently viewing test results from clinical labs electronically, and nearly two-thirds (63.3%) of these view at least 60% of their lab results electronically, primarily through an office EHR system.
    - Physicians ages 60 and over, solo physicians, and specialists are significantly less likely to view test results from clinical labs electronically.
- Among those not viewing lab test results electronically (37.4%), 60.7% have no plans to view lab results electronically in the future. Financial costs are cited by about a third (32.3%) as the main reason for not viewing lab results electronically.
- For sending lab test requests electronically, fewer participate (37.1%), but again, nearly two-thirds (65.5%) of these send at least 60% of their lab requests electronically, and again, primarily through an office EHR system.
    - Solo physicians and those in two-physician practices are significantly less likely to send lab test requests electronically. Specialists are about half as likely to do so, while physician age was unrelated to this capability.
- Among those not sending lab requests electronically (61.5%), about two-thirds (63.7%) have no plans to gain this capacity in the future. Financial costs are again cited most often (26.9%) as the main reason for not sending lab requests electronically, followed by low participation by surrounding labs (20.1%).
- A large majority of physicians felt that electronic lab requests/results delivery would have a very or somewhat positive impact on most aspects of their practice. This was especially true for care coordination (77.6%) and information availability (77.0%). The exceptions were impact on overall healthcare costs and patient-doctor interaction where less than half (44.0% and 49.1%, respectively) thought it would have a positive impact.
- For implementing or expanding the use of electronic lab requests/results delivery, start-up financial costs was the top barrier cited, with 43.0% of physicians saying it was a major barrier and another 30.6% saying it was a minor barrier. Physician skepticism, privacy or security concerns, computer skills of physician/staff, and low participation by area labs were rarely cited as major barriers.
- Physicians ages 60 and over, solo physicians, and specialists were significantly less likely to view test results from clinical labs electronically.
    - Primary care physicians and physicians in larger practices were more likely, whereas older physicians were less likely to view 60% or more of their lab results electronically.

- Among those not viewing lab results electronically, physicians ages 40-59 and primary care physicians are more likely to plan to get this capability in the future.
    - Financial cost of the system (startup/ongoing) was more likely to be reported as the main reason for not viewing lab results electronically by all physician age groups (with the exception of physicians ages 40-49), and primary care physicians.
- For sending lab results electronically, solo physicians and those in two-physician practices were significantly less likely to send lab test requests electronically.
    - Specialists were about half as likely to do so, while physician age was unrelated to this capability.
- Among those not sending lab orders electronically, physicians ages 40-59, and primary care physicians were more likely to gain this capability in the future.
    - Primary care physicians were more likely to report financial cost of the system (start-up/ongoing) as the main reason for not sending lab orders electronically.
- Older physicians were less likely to report a positive effect of electronically sending and viewing lab orders on their practice.
    - Primary care physicians and larger practices were more likely to report a positive impact of electronically sending and viewing lab orders on their practice.
- For many barrier measures, older physicians were more likely and larger practices were less likely to report that beginning or expanding the use of electronic lab results/order entry would be major or minor barriers for their practice.
    - Solo physicians were more likely to report lack of time to acquire knowledge about systems as a major barrier, whereas specialists were more likely to report privacy or security concerns, financial costs of the system, low participation by area labs, and lack of uniform standards as minor or major barriers for their practice.

Chapter 3 covers physician use of electronic health records (EHRs). Descriptive data and cross-tabulations by physician age, practice size, and primary specialty groups for relevant items from the physician survey are included in this report.

- Key findings include:
    - Nearly half (48.9%) of NJ physicians are currently maintaining 100% of patient records in their EHR system.
        - Among those using an EHR system, about six in 10 (56.7%) provide a clinical visit summary from their main practice EHR to at least 50% of their patients.

        - About four in 10 (43.2%) use a summary of care document for transitions of care for at least 50% of their patients.
    - A little more than half (52.4%) currently use a CCHIT-certified EHR system, and about five in 10 (52.1%) received an EHR incentive payment from CMS for adoption and/or meaningful use of a certified EHR.
    - Among those not currently using an EHR system, more than half (51.5%) have no plans to gain this capability in the future.
    - Physicians in larger group practices were more likely to maintain 100% of their patient records on an EHR system, provide a clinical visit summary from their EHR to 100% of their patients, implement new technology in an earlier phase, and receive an incentive payment from CMS for the adoption and/or meaningful use of a certified EHR.
        - Physicians ages 69 and younger were more likely to maintain 100% of their patient records on an EHR system.
        - Specialists were less likely to use a summary of care document for transitions of care for their patients as compared to primary care physicians.
    - Among those not currently using an EHR, as practice size increased, physicians were more likely to implement an EHR system in the future.
        - Specialists were less likely to adopt an EHR system at their practice, and physicians ages 40 and over were more likely to never implement an EHR at their practice.

Chapter 4 covers physician participation in NJ's six regional HIOs. Data sources include the follow-up phone/fax physician survey, the physician mail survey, and HIO Use Metrics. Descriptive data and cross-tabulations by physician age, practice size, and primary specialty groups for relevant items from the physician survey are included with this report.

- Key findings include:
    - A small number of physicians from the 2013 physician mail survey were aware of the presence of an HIO in their area and the services they provide and even smaller numbers were participating in one or more regional HIOs in their area.
        - Among all six HIOs in NJ, the physician participation was highest for Virtua.
    - Physicians participating in an HIO reported a moderate level of understanding of how data is shared through an HIO but were unaware of how they are funded.
        - Most physicians were receiving reports, laboratory results, and radiology results and felt that they were either very useful or somewhat useful to them.

- The majority of physicians were somewhat satisfied with sharing health information with their HIOs and also other providers, found accessing information somewhat/very easy, but felt that integrating information from an HIO into their workflow is somewhat difficult.
- Most physicians felt a very or somewhat positive impact of electronic sharing of information via an HIO on their practice. However, some physicians felt that it would have a somewhat negative impact on productivity and healthcare costs.
- For barriers to current or continued participation in an HIO, training time (productivity loss) was the leading barrier followed by computer technical support, lack of uniform standards within the industry, support from vendors for upgrading or maintaining the HIO system, and low participation by area physicians and other providers.
- The most frequent responses for other services or information that physicians would like to get from an HIO were for lab reports and cardiology reports.
- Physicians said that they joined an HIO for continuity of care, easier access of patient information, or as part of their practice.
- The most frequently cited reason for dissatisfaction was the incapability of the infrastructure to provide easier access to patient information.
    - Some physicians felt that satisfaction would improve if all providers were linked, and HIO and EHR were integrated.
    - However, some physicians raised concerns about the accidental or purposeful breach of privacy.
- The more commonly cited support needed from the State was for standardization of the system, communication with physicians about the benefits of participation in an HIO, and making HIOs fully operational.

- Among physicians not participating in an HIO, the majority were aware of how data is shared through an HIO but were unaware of how they are funded.
    - The level of understanding of physicians for how HIO data exchange works varied from “none” to “moderate” level.
    - Most physicians said that they were not aware of an HIO in their area and shared an interest in joining an HIO.
        - Some physicians plan to start participating in 2014.
    - Most physicians felt that the impact of electronic sharing of information via an HIO would have a very or somewhat positive impact on their practice.

        - However, some physicians felt that it would negatively impact productivity. Some additional factors shared were staff time, steep learning curve, and difficulty in coordinating vendors for data sharing.
    - For barriers to beginning participation in an HIO, ongoing financial costs, personnel and /or time to select and implement the HIO system, and training time (productivity loss) were the leading barriers followed by start-up costs, the financial return on investment, obtaining and updating patient consent, and lack of time to acquire knowledge about HIO systems.
    - The most frequently cited reason for not participating was the lack of an opportunity to participate. This was followed by cost, complexity of set up and maintenance, multiple incompatible systems, rare need for lab data, and lack of time and participation.
    - The more commonly cited support needed from the State was for standardization and facilitation of the process and making the information available to physicians. This was followed by financial and technical support incentives to reduce costs. Physicians shared that these incentives might help them to start participating.
  - For the HIO Use Metrics, the number of affiliated hospitals increased for all five HIOs that provided data in 2013.
    - The total number of individuals with access to query-based exchange improved for NJSHINE, Health-e-cITi-NJ, and Camden Coalition.
    - The number of acute care hospitals participating in query-based exchange increased for both Jersey Health Connect and Health-e-cITi-NJ. The total number of patient record queries submitted from ambulatory entities as well as acute care hospitals was highest for NJSHINE.

Chapter 5 covers physician use of clinical summaries. Data sources include the follow-up phone/fax physician survey and the physician mail survey. Descriptive data and cross-tabulations by physician age, practice size, and primary specialty groups for relevant items from the physician survey are included with this report.

- Key findings include:
  - Physicians who use clinical summaries indicated benefits to patients, improved accuracy of clinical information, and benefits to other providers.
    - The most frequently cited workflow adjustments necessary to implement clinical summaries for the majority of physicians was entering information during the appointment.

        - Other drawbacks to the use of clinical summaries were time and paper waste.
    - More than half of physicians exchanged clinical summaries with other providers and electronic system compatibility was a major concern. Physicians were most likely to receive information about clinical summaries from an EHR vendor or IT Department.
- For physicians who do not use clinical summaries, cost and time were the main reasons for not implementing clinical summaries in their practices.
    - Few physicians reported receiving information from any source about implementing clinical summaries.
    - There was a range of EHR skill level with some physicians indicating that EHRs have limited clinical value or that the nature of their practice does not support the use of EHRs (e.g., psychiatry or pediatric practices).
    - Nearly half of physicians plan to implement clinical summaries in the future.
- Over half of physicians (57.3%) on the 2013 physician mail survey provided a clinical visit summary to at least 50% of their patients.
    - Less than half (42.9%) of physicians provided electronic patient care summaries to other providers.
    - About one-quarter (23.0%) accessed electronic patient care summaries created by other providers.
    - The majority of physicians felt that electronic patient care summaries would have a positive impact, especially for information availability (74.9%) and care coordination (72.4%).
        - The exception was the impact on overall healthcare costs, where only 44.7% thought electronic patient care summaries would have a positive impact.
    - For implementing or expanding the use of electronic patient care summaries, lack of uniform standards within the industry was the top barrier, followed by financial costs.
        - Physician skepticism and computer skills were rarely cited as major barriers.
    - Younger physicians were more likely to provide electronic patient care summaries to other providers, and to report a positive effect of electronic patient care summaries on their practice.
        - Larger practices were more likely to both provide and access electronic patient care summaries from other providers and to

report a positive effect of electronic patient care summaries on their practice.

- Primary care physicians were more likely to report a positive impact on healthcare costs and patient satisfaction.

Chapter 6 contains conclusions and trends across the previous five chapters.

The Appendices contain all survey instruments and mailing materials and a methods report for the physician survey.

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Introduction

The Health Information Technology for Economic and Clinical Health Act (HITECH Act) was enacted under Title XIII of the American Recovery and Reinvestment Act (ARRA) which was signed into law by the president on February 17, 2009 (One Hundred Eleventh Congress of the United States of America 2009). Under the HITECH Act, the United States Department of Health and Human Services is spending approximately $32 billion to promote and expand the adoption of health information technology (health IT) for the electronic sharing of clinical data among hospitals, physicians, and other health care stakeholders (Redhead 2009). Health IT consists of interoperable electronic health records (EHRs) including computerized systems to prescribe medications, order and view lab tests, generate patient care summaries, provide clinical decision support, and to develop health information networks that allow providers to securely exchange health information.

The HITECH Act under Title IV, Division B, established financial incentive payments to eligible professionals, eligible hospitals, and critical access hospitals through the Medicare and Medicaid EHR Incentive program. This program is intended to fund investments in health IT infrastructure, purchasing EHR systems, and training. Eligible physicians who adopt, implement, upgrade, or demonstrate “meaningful use” of certified EHR technology can receive a maximum of $44,000 through Medicare and up to $63,750 through Medicaid over five continuous years in the program (CMS 2014). These incentive payments will eventually be replaced by financial penalties for physicians and hospitals that are not using certified EHRs. The Congressional Budget Office estimated that the HITECH Act will save the Medicare and Medicaid programs a total of about $12.5 billion through 2019 (Redhead 2009). As of December 2013, approximately

$6.6 billion has been distributed in incentive payments to 323,293 eligible professionals overall and about $180.5 million to 10,862 eligible professionals in New Jersey (CMS 2013a, 2013b).

In January 2011, the Office of the National Coordinator for Health IT (ONC) awarded $11.4 million to NJ for the state's strategic and operational plan for health information exchange. As a requirement of the ARRA funding received by NJ and as addressed in part of The State of New Jersey's Health Information Technology (Health IT) Operational Plan update submitted by the NJ Health IT Coordinator's Office in June 2012 to the U.S. Department of Health and Human Services' National Coordinator for Health Information Technology, an independent evaluation of the state health IT program was mandated. This evaluation plan must focus on "evaluating progress, identifying lessons learned, and measuring the value of the highest priority areas of the state health IT program" (NJDHSS 2012). The areas to be evaluated include three key health IT use criteria: (1) e-prescribing by pharmacies and physicians, (2) electronic lab results by laboratories and physicians, and (3) use of patient care summaries by physicians, and (4) evaluate NJ physician participation in regional health information organizations (HIOs).

In order to comply with this requirement, the NJ Health IT Coordinator's Office engaged the Rutgers University Center for State Health Policy (CSHP) to complete a series of multi-method analytic activities to inform the evaluation of health IT implementation in the State. As part of that work, CSHP conducted and analyzed a physician mail survey, clinical laboratory and pharmacy mail surveys with phone follow-up, and physician follow-up phone surveys in late 2013 to early 2014. In addition, HIO user metrics were collected from the NJ Department of Health and analyzed by CSHP researchers. Findings converged in several key themes across all data components. This effort was funded via a grant from the NJ Department of Health, Health IT Coordinator's Office, which in turn received funding for the evaluation from the Office of the National Coordinator of Health IT.

The Institutional Review Board of Rutgers University approved this study. Findings from all of these research efforts are compiled in this report. A brief description of each data source is provided below.

Chapter 1: Electronic Prescribing (E-Prescribing) by NJ Pharmacies and Physicians: An Analysis of the 2013-2014 Non-E-Prescribing Pharmacy Survey and the 2013 Physician Survey. The non-e-prescribing pharmacy survey was designed by CSHP using predominantly existing questions taken from national surveys with feedback from the NJ Health IT Coordinator's Office and representatives of NJ-HITEC and NJ's regional HIOs. It was conducted by mail with phone follow-up in late 2013-early 2014 (N=19). Survey topics included barriers to implementing e-prescribing, perceptions about the impact of e-prescribing on pharmacy practice, and future

plans for implementation, if any. The physician survey was designed by CSHP using predominantly existing questions taken from national surveys with feedback from the NJ Health IT Coordinator's Office and representatives of NJ-HITEC and NJ's regional HIOs. The fieldwork was conducted October 11, 2013, through December 1, 2013, by Abt SRBI, a national survey vendor. A random sample of 5,600 active, office-based physicians with a main office location in NJ was drawn from AMA Masterfile data (N=18,621) provided by Medical Marketing Services, an approved Masterfile data vendor. Completed survey data were received from Abt SRBI for 958 physicians (response rate 17.3%), which was weighted to the population primary specialty data. A detailed methods report with the questionnaire and other mailing materials is in the Appendices at the end of the report. Topics of interest such as use of e-prescribing, plans for implementation, and benefits of and barriers to the implementation and use of e-prescribing were analyzed by key physician and practice characteristics (physician age, practice size, and primary specialty groups).

Chapter 2: Electronic Lab Requests/Results: An Analysis of the 2013-2014 NJ Health IT Hospital and Clinical Laboratory Survey and the 2013 Physician Survey. The pharmacy survey was designed by CSHP using predominantly existing questions taken from national surveys with feedback from the NJ Health IT Coordinator's Office and representatives of NJ-HITEC and NJ's regional HIOs. It was conducted by mail with phone follow-up in late 2013-early 2014 (N=76). Survey topics included use of computerized physician order entry (CPOE) systems, capability, standards used to send electronic lab results to providers, methods used to send reportable laboratory results to NJ DOH, methods used to send laboratory results to patients, health information exchange with NJ's six regional HIOs, barriers to implementation or expansion of electronic capability, and future plans for implementation, if any. The physician survey is described above under Chapter 1. Topics of interest such as use of electronic lab requests/results, plans for implementation, and benefits of and barriers to the implementation and use of electronic lab requests/results were analyzed by key physician and practice characteristics (physician age, practice size, and primary specialty groups).

Chapter 3: Physician Use of Electronic Health Records (EHRs): An Analysis of the 2013 Physician Survey. The 2013 physician survey is described above under Chapter 1. Topics of interest such as use of EHRs, EHR vendor used, when EHR system installed, EHR certification, and receipt of incentive for meaningful use of EHRs were analyzed by key physician and practice characteristics (physician age, practice size, primary specialty groups.

Chapter 4: Physician Participation in NJ's Regional HIOs: An Analysis of the Physician HIO Participation Follow-up Survey, the 2013 Physician Survey, and HIO Use Metrics. Random samples of physicians participating in regional HIOs and not participating in HIOs were drawn

from respondents to the physician survey. CSHP designed semi-structured interview questionnaires for the two samples after initial consultation with representatives from NJ's six regional HIOs, feedback from the NJ Health IT Coordinator's Office, and a literature review of similar studies. It was conducted by phone with fax follow-up. Topics such as usefulness of information received through an HIO, satisfaction with participation, benefits of participation, barriers to beginning or continued participation, and future plans for participation (for non-users) were included in the questionnaire. The 2013 physician survey is described above under Chapter 1. Topics of interest such as physician awareness of and participation in one or more of NJ's six regional HIOs were analyzed by key physician and practice characteristics (physician age, practice size, primary specialty groups. The NJ HIO Use Metrics for each month of 2013 were sent by five of NJ's six regional HIOs to the NJ Department of Health who provided them to CSHP for trend analysis.

Chapter 5: Physician Use of Electronic Clinical Summaries: An Analysis of the Physician Clinical Summary Follow-up Survey and the 2013 Physician Survey. The semi-structured electronic clinical summary phone interview was designed by CSHP with feedback from the NJ Health IT Coordinator's Office and representatives of NJ-HITEC. Random samples of physicians using electronic clinical summaries and non-users were drawn from respondents to the physician survey. A phone interview with fax follow-up was conducted in early 2014. Survey topics included awareness of meaningful use criteria, method used to provide clinical summaries to patients, workflow adjustments, content of electronic clinical summary, method of exchange with other providers, benefits, barriers, and future plans for implementing or maintaining electronic clinical summaries. The 2013 physician survey is described above under Chapter 1. Topics of interest such as use of electronic clinical summaries, benefits of use, and barriers to implementing or expanding the use of electronic clinical summaries were analyzed by key physician and practice characteristics (physician age, practice size, primary specialty groups).

Chapter 6: Conclusions. This chapter contains conclusions and trends across the previous five chapters.

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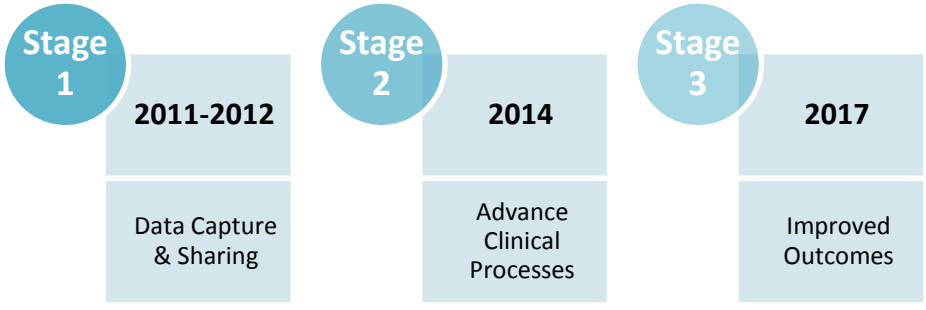
Chapter 1: Electronic Prescribing (E-Prescribing) by NJ Pharmacies and Physicians: An Analysis of the 2013-2014 Non-E-Prescribing Pharmacy Survey and the 2013 Physician Survey

Introduction

In this chapter, we examine the barriers to implementation of e-prescribing by NJ pharmacies and the use of e-prescribing by active, office-based physicians with a main office location in NJ. The Institute of Medicine report in 2000 titled *To Err is Human: Building a Safer Health Care System* brought attention to preventable medication errors associated with paper prescribing practices and called for the use of health IT such as transmitting prescriptions electronically (e-prescribing) to improve patient safety (IOM 2000, 2001). The Centers for Medicare and Medicaid Services acknowledges that e-prescribing plays an important role in improving patient care and requires eligible providers (EP) to e-prescribe as part of meaningful use criteria to qualify for incentive payments (Blumenthal and Tavenner 2010). National trends indicate that e-prescribing by physicians is increasing rapidly. According to the ONC, in December 2008, 7% of physicians in the U.S. were e-prescribing using an EHR; by June 2012, almost half (48%) of physicians in the U.S. and over a third (38%) specifically in New Jersey were e-prescribing using an EHR on the Surescripts network (Hufstader, Swain, and Furukawa 2012).

There are three steps to the Medicare and Medicaid EHR Incentive Programs with increasing requirements for participation in each stage. Providers are to meet Stage 1 requirements for a 90-day period in their first year of meaningful use participation and a full year in their second year. Providers then have to complete Stage 2 requirements for two full years after completing Stage 1 (CMS 2013). At the time of this report, the requirements for Stage 3 are still under development and have yet to be finalized. Below is a timeline of the stages of meaningful use requirements.



For providers, the meaningful use objectives for Stage 1 and Stage 2 both contain one core objective directly related to the use of e-prescribing. The table below describes the specific meaningful use measures for Stage 1 and Stage 2.

Table: Meaningful Use Measures Related to E-Prescribing

	Measure	Objective	Requirement
Stage 1	Core Measure 4 of 14 **e-Prescribing (eRx)**	Generate and transmit permissible prescriptions electronically (eRx).	More than 40 percent of all permissible prescriptions written by the EP are transmitted electronically using certified EHR technology (CEHRT).
Stage 2	Core Measure 2 of 17 **e-Prescribing (eRx)**	Generate and transmit permissible prescriptions electronically (eRx).	More than 50 percent of all permissible prescriptions, or all prescriptions, written by the EP are queried for a drug formulary and transmitted electronically using CEHRT.

To evaluate whether providers are adopting e-prescribing in their practice, CSHP conducted a mail survey of office-based physicians. Among other health IT topics and general physician and practice characteristics, the survey contained a section on e-prescribing. This section inquired about whether or not providers transmit prescriptions to pharmacies electronically, what year e-prescribing was implemented in their practice, the percentage of prescriptions sent electronically to a pharmacy and what type of e-prescribing method they used. The survey measured whether the impact of e-prescribing has had a positive or negative effect on key workflow and care management outcomes. Barriers to beginning or expanding the use of e-prescribing were also measured. For providers that said they do not e-prescribe, questions were asked about whether or not they had plans to implement in the near future and when they planned on implementing. Also, for non-e-prescribers, a question was asked about the main reason for not adopting e-prescribing.

This chapter presents findings using data from the 2013-2014 Non E-Prescribing Pharmacy Survey and the 2013 Physician Survey conducted statewide in New Jersey.

Part A: Non E-Prescibing Pharmacy Survey

Background

Exchanging prescription information electronically (e-prescribing) between physicians and pharmacies may improve the accuracy of the prescribing process and also saves time. E-prescribing was brought into the spotlight in 2003 with the approval of the Medicare Modernization Act (MMA). Implementation of e-prescribing is cost-effective for both physicians and pharmacies. For pharmacies, it can save time and resources by systematizing the workflow, reducing paperwork, reducing opportunity for medication error, enhancing patient safety, and increasing patient convenience (HRSA 2014; Surescripts 2014). The speed or efficiency of processing is notably improved due to clarity in submitted prescriptions and the ability to check eligibility in advance (Rupp and Warholak 2008). While there are many benefits associated with e-prescribing, there are also many challenges associated with the implementation and maintenance of the system. The most commonly reported barriers to implementing e-prescribing in pharmacies in other states (Connecticut, Florida, and Nebraska) were prescription transaction fees, low prescriber activity in the area, start-up costs, and maintenance costs (FAHCA, n.d.; Lander et al. 2013; Tikoo 2011).

In New Jersey, based on estimates from the State Health IT Operational Plan, over 95% of pharmacies can accept electronic prescriptions (NJDHSS 2012). The objectives of this study were to identify the attitudes, beliefs, and barriers to adoption of e-prescribing among non-e-prescribing New Jersey pharmacies and their future plans for implementation, if any. To accomplish this, CSHP conducted a mail survey with telephone follow-up of the state's non-e-prescribing pharmacies. The results of this survey will help the NJ Health IT Coordinator's Office better understand the concerns of non-participating pharmacies and develop a strategy for outreach to promote adoption of e-prescribing.

Methods

The mail survey with telephone follow-up of non-responders was conducted from October 24, 2013, to January 31, 2014. The survey questionnaire (see Appendices) was developed by CSHP research staff with input from the NJ Health IT Coordinator's Office and representatives from NJ HITEC and the state's six HIOs. Survey topics included barriers to implementing e-prescribing, perceptions about the impact of e-prescribing on pharmacy practice, and future plans for implementation, if any. A list of pharmacies, which were believed to be non-e-prescribing pharmacies, was provided by the NJ Health IT Coordinator's Office through resources made available by ONC. The survey questionnaire along with a cover letter on State letterhead signed

by the NJ Health IT Coordinator that explained the nature of the survey was mailed to the state's 98 non-e-prescribing pharmacies. The respondents had 3 weeks to respond to the survey. A follow-up telephone call was then made to non-responders to encourage their participation in the survey. They were also given the opportunity to complete the survey on the telephone.

Another list of non-e-prescribing pharmacies was obtained from Horizon's website (Horizon 2012). This list was matched to the State's list and duplicates were removed. All the pharmacies in this list were called to request participation. Table 1 contains the number of interviews completed from each list. The overall response rate for the survey (after excluding pharmacies which were found to be e-prescribing, closed, disconnected, or not a pharmacy) was 21.3%.

Table 1: Status of Pharmacy Response

Status	List 1	List 2	Total
Completed*	12	7	19
Still Waiting*	19	31	50
Refused*	16	4	20
E-Prescribing	20	17	37
Closed	17	7	24
Disconnected	9	19	28
Not a Pharmacy	5	6	11
TOTAL	98	91	189

*Denominator (Total = 89, highlighted in green above) includes all pharmacies which completed interviews, refused, or did not respond.

Pharmacy Measures

Pharmacy measures included pharmacy type, prescription dispensing volume per day, level of health IT understanding, future plans for implementation of e-prescribing, barriers to e-prescribing, perceptions about the benefits of implementation on pharmacy practice, current physician adoption of e-prescribing in their area and the level that would prompt them to implement, and awareness of health information organizations (HIOs) in their area and plans for participation in one of the six New Jersey HIOs.

The respondents indicated their pharmacy prescription dispensing volume by choosing from five categories, which were then collapsed into the following three categories: 0-50 prescriptions per day, 51-100 prescriptions per day and more than 100 prescriptions per day. To assess pharmacies' level of health IT understanding, respondents were asked to rate their level of understanding of how e-prescribing works by selecting from four categories. The categories were collapsed to the following two groups: None or very little knowledge about e-prescribing,

and moderate to high understanding about e-prescribing. To determine perceptions of e-prescribing's effect on pharmacy practice, respondents were asked to choose from a 5-point Likert scale: "Very positive," "Somewhat positive," "No effect," "Somewhat negative," "Very Negative." This was re-coded into 3 categories: "Very/somewhat negative," "No effect," and "Somewhat/very positive."

This report contains frequencies of all survey items. Cross-tabulations are not reported due to small sample size.

Findings

Tables 1.1-1.5 contain frequencies of pharmacy characteristics, future plans for implementation of e-prescribing, barriers to e-prescribing, and perceptions about the benefits of implementation on pharmacy practice.

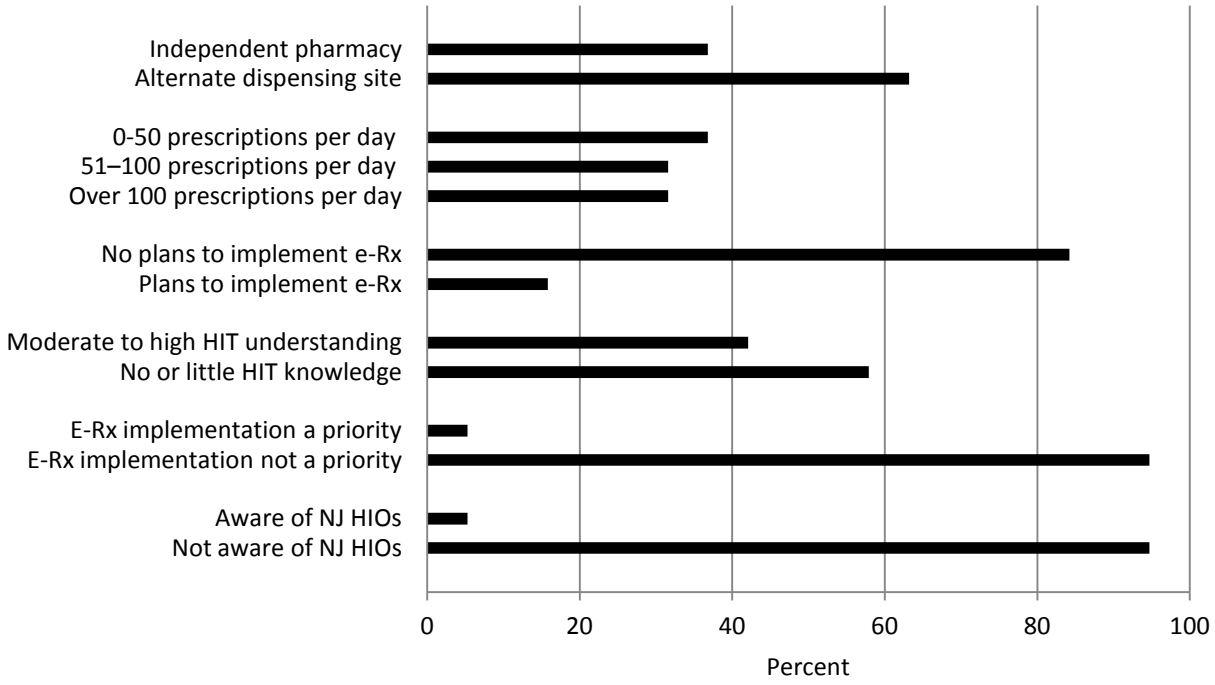
Pharmacy Characteristics

As shown in Table 1.1 and Figure 1.1, slightly more than one-third of the pharmacies (36.8%) were independent and the rest (63.2%) were alternate dispensing sites (i.e., home infusion sites, NJ State facilities, long term care facilities, and specific compounding pharmacies). The prescription dispensing volume for about one-third (36.8%) of the pharmacies was 0-50 prescriptions per day, another third (31.6%) were dispensing 51-100 prescriptions per day, and the rest were dispensing more than 100 per day. Nearly 60% (57.9%) reported no or very little knowledge of how e-prescribing works. Two pharmacies expressed interest in getting more information about e-prescribing.

Future Implementation Plans

Overall (see Figure 1.1), slightly more than four-fifths (84.2%) reported no plans to implement e-prescribing in the future. Of those planning to implement, two-thirds (66.6%) reported their intent to e-prescribe within two years. All except one pharmacy reported that implementing e-prescribing is not a priority for their pharmacy at this time. If fully implemented, only half felt that it would save time. Slightly more than one-third (36.8%) estimated the current physician adoption of e-prescribing in their area at 0%, and 41.2% reported that they would also implement e-prescribing if close to 60% of physicians in their area e-prescribe. About one-fourth plan to accept only written or call-in prescriptions.

Figure 1.1: Pharmacy Characteristics, Implementation Plans, Level of Health IT Understanding and HIO Awareness for Non-E-Prescribing NJ Pharmacies



Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Barriers to Implementation

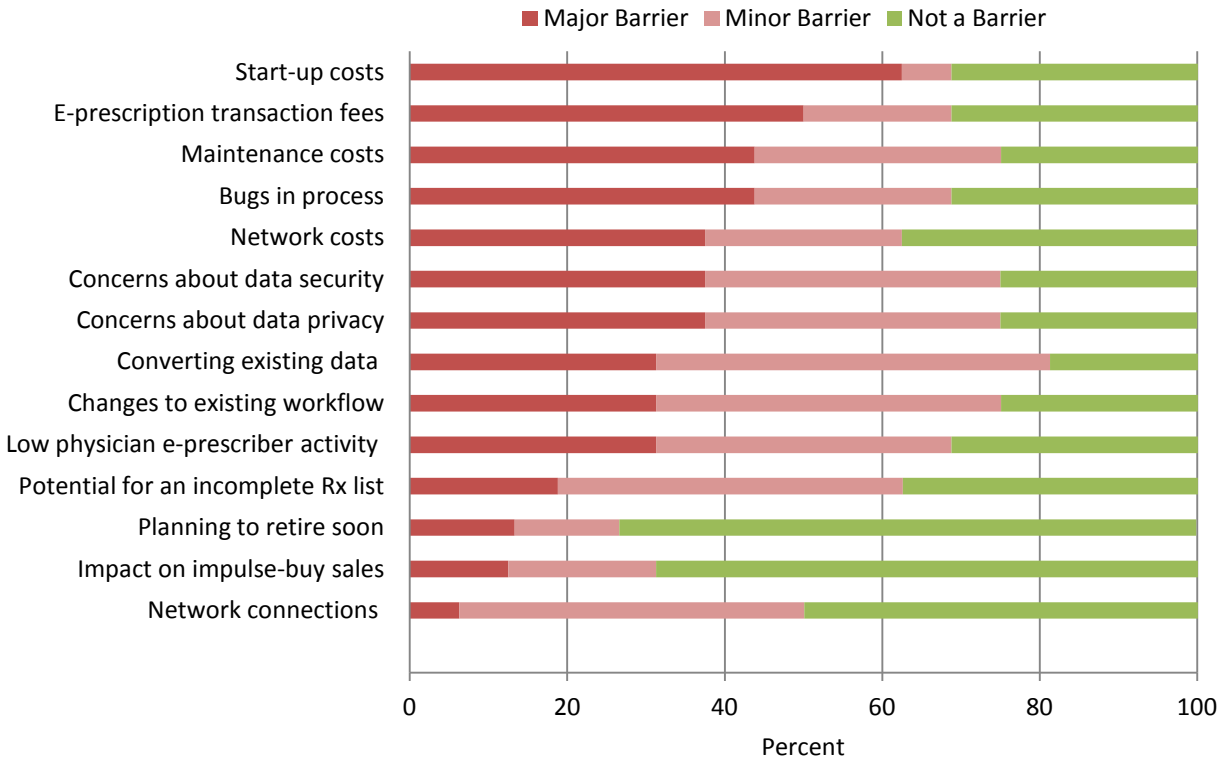
The major barriers to implementation of e-prescribing by pharmacies (see Table 1.2 and Figure 1.2) were start-up costs (62.5%), maintenance costs (43.8%), prescription transaction fees (50.0%), and bugs in the e-prescribing process (43.8%). More than one-third (37.5%) said that start-up costs were the most important barrier to not implementing e-prescribing (see Table 1.3).

> *"Lower transaction fees. Doctors don't pay, why should we?"*

Three-fourths (75.0%) said concerns about security of patient data and concerns about privacy of patient data were either a minor or a major barrier. Some of the other minor barriers reported were converting existing data into the e-prescribing system (50.0%), potential for incomplete medication list (43.8%), and changes to existing workflow (43.8%). More than two-thirds (68.8% and 73.3%, respectively) said that the impact on consumer purchases while waiting for prescriptions to be filled, i.e., impulse-buy sales, and their forthcoming retirement plans were not barriers for their pharmacy. Network connections of the area were reported either as a minor barrier or not a

barrier by all except one pharmacy. For network costs, slightly more than one-third (37.5%) reported it as a major barrier whereas the same number of pharmacies stated it was not a barrier for them. Two pharmacies said that the system needs to be standardized. One pharmacy said that they don't have a sufficient need to engage in e-prescribing.

Figure 1.2: Barriers to Implementing E-Prescribing



Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

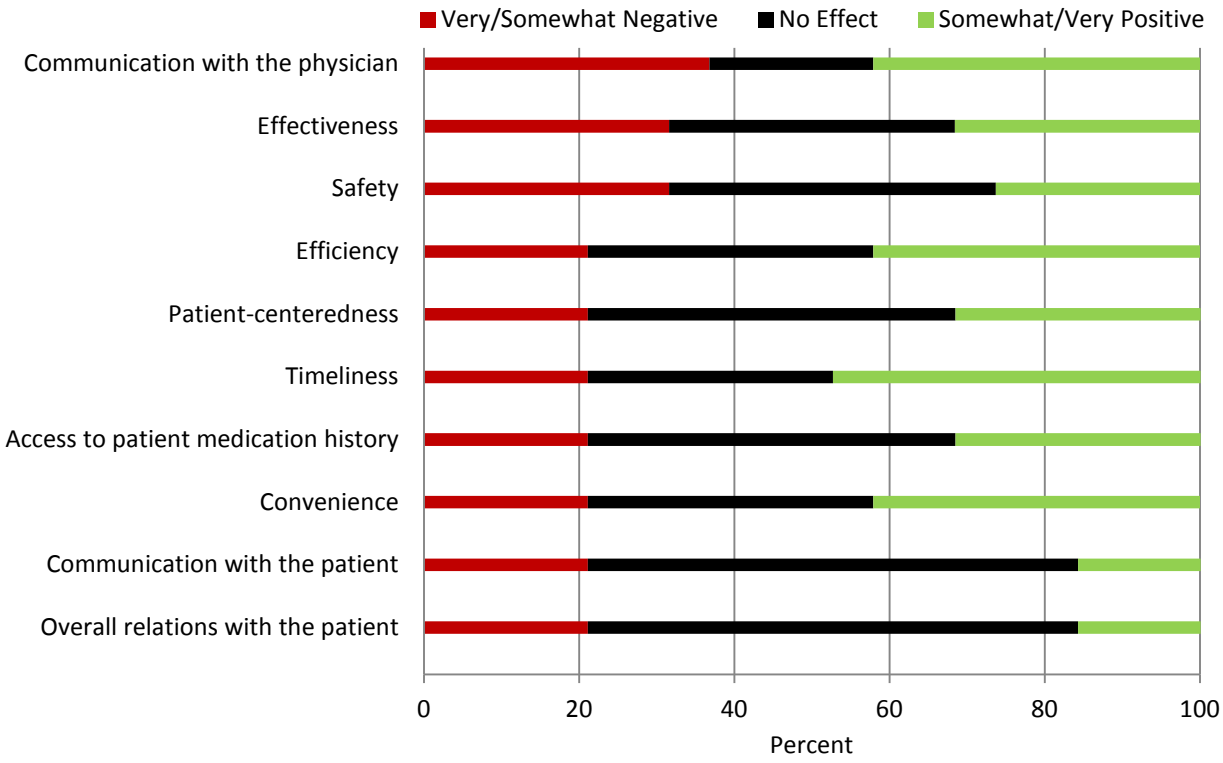
Perceptions about Effects of E-Prescribing on Pharmacy Practice

More than three-fourths of the pharmacies (see Table 1.4 and Figure 1.3) believed that there would be either no effect or a positive effect of e-prescribing on efficiency (no effect = 36.8%; somewhat/very positive = 42.1%), patient-centeredness (no effect = 47.4%; somewhat/very positive = 31.6%), timeliness (no effect = 31.6%; somewhat/very positive = 47.4%), access to patient medication history (no effect = 47.4%; somewhat/very positive = 31.6%), and convenience (no effect = 36.8%; somewhat/very positive = 42.1%) of the pharmacy practice. For effectiveness, the response was almost equally divided among the three response categories (very/somewhat negative = 31.6%; no effect = 36.8%; somewhat/very positive = 31.6%).

Nearly two-thirds (63.2%) perceived that e-prescribing would have no effect on communication with the patients and overall relations with the patients. However, more than one-third believed that communication with the physician could be either positively (42.1%) or negatively (36.8%) impacted. For safety, 42.1% reported that e-prescribing would have no effect whereas 31.6% felt that it would negatively affect safety. One respondent said that the chances of selecting the wrong drug would be higher because of the wrong drug selection by the physician.

> *"I believe our physicians will have a hard time with this and it negates the personal contact we have with the pharmacists."*

Figure 1.3: Effect of E-Prescribing on Pharmacy Practice



Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Participation in Health Information Organizations (HIOs)

All except one pharmacy (94.7%) reported that they are not familiar with New Jersey regional HIOs in their area and the services they provide (see Table 1.5). Only one pharmacy reported interest in participating in one of the six New Jersey HIOs.

Conclusions

The leading factors for non-participation in e-prescribing were the financial burden on the pharmacy (start-up and maintenance costs, prescription transaction fees), bugs in the systems, low rate of e-prescribing adoption by area physicians, lack of knowledge about how e-prescribing works, and the perceived benefits or lack thereof of e-prescribing implementation in improving workflow and care coordination.

When asked whether certain factors were a major or minor barrier or not a barrier, the most common major barrier to implementation was start-up costs. Other major barriers cited were prescription transaction fees, maintenance costs, and bugs in the e-prescribing process. There were some minor concerns about security and privacy of patient data, transferring existing data into an e-prescribing system, incomplete medication list, changes to the current workflow, and network costs and connectivity of the area. Retirement plans and also the impact on sales of customer purchases while waiting for prescriptions to be filled would not impact their decision to implement.

Pharmacies believed that implementation would either not impact or might help in streamlining workflow, reducing processing time for patients, improving turn-around time, decreasing callbacks to physicians, misplaced prescriptions, and increasing access to patient medication history. It may or may not improve the ability to track patient medication adherence and communication with the physician but many believed that it would not impact the communication and overall relations with the patient. There were some concerns about the effect of e-prescribing on safety such as ability to check for medication errors, drug interactions, and drug allergies.

A large number of pharmacies were unaware of how e-prescribing works. The responding pharmacies were mainly independent or alternate dispensing sites, and the majority of them were not planning to implement e-prescribing in the future. They do not see it as a priority for their pharmacy and only half believe that it would save time if fully implemented. Some respondents shared interest in getting more information. Most pharmacies were not aware of the existence of HIOs in their area and were not interested in participating in HIOs to exchange information. Half of the pharmacies were perceived by pharmacists to be located in areas where physician adoption rate of e-prescribing is low. An increase in demand as more physicians start e-prescribing could act as a driving force for these pharmacies to begin accepting e-prescriptions.

Part B: Physician Survey

Methods

The physician survey was designed by CSHP using predominantly existing questions taken from national surveys with feedback from the NJ Health IT Coordinator's Office and representatives of NJ-HITEC and NJ's regional HIOs. The fieldwork was conducted October 11, 2013, through December 1, 2013, by Abt SRBI, a national survey vendor. A random sample of 5,600 active, office-based physicians with a main office location in NJ was drawn from AMA Masterfile data of all active, office-based NJ physicians (N=18,621) provided by Medical Marketing Services, an approved Masterfile data vendor. Completed survey data were received from Abt SRBI for 958 physicians (response rate 17.3%), which was weighted to the population primary specialty data so as to be representative of all active, office-based physicians with a main office location in NJ. A detailed methods report with the questionnaire and other mailing materials is in the Appendices at the end of this report. Topics of interest such as use of e-prescribing, plans for implementation, and benefits of and barriers to the implementation and use of e-prescribing were analyzed by key physician and practice characteristics (physician age, practice size, primary specialty groups).

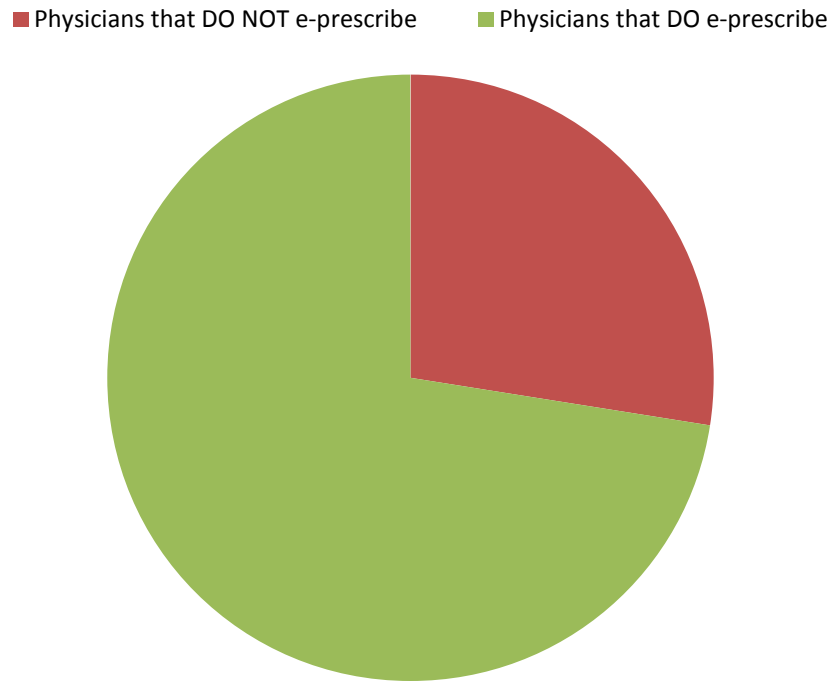
Frequencies of all measures and cross-tabulations of all measures by age, practice size, and primary specialty groups are presented. Most survey questions had item non-response below 5%. For these variables, missing values are excluded from the analysis.

Findings

Frequencies-Physician Use of E-Prescribing, Barriers to Implementation, Benefits

Table 1.6 contains the weighted frequencies for the e-prescribing items contained in Section A of the physician survey. Nearly three-fourths (72.5%) of physicians are currently transmitting prescriptions to pharmacies electronically (see Figure 1.4). Of these, about a quarter (26.9%) implemented e-prescribing before 2010; implementation increased steadily from 2010 to 2012, with a slight drop-off in 2013. Among those currently e-prescribing, the vast majority (74.0%) use e-prescribing for at least 60% of all their prescription orders, and the most common method of e-prescribing is via an office EHR system (84.0%); most of the remaining (15.9%) use an external web portal.

Figure 1.4: Physician Use of E-Prescribing

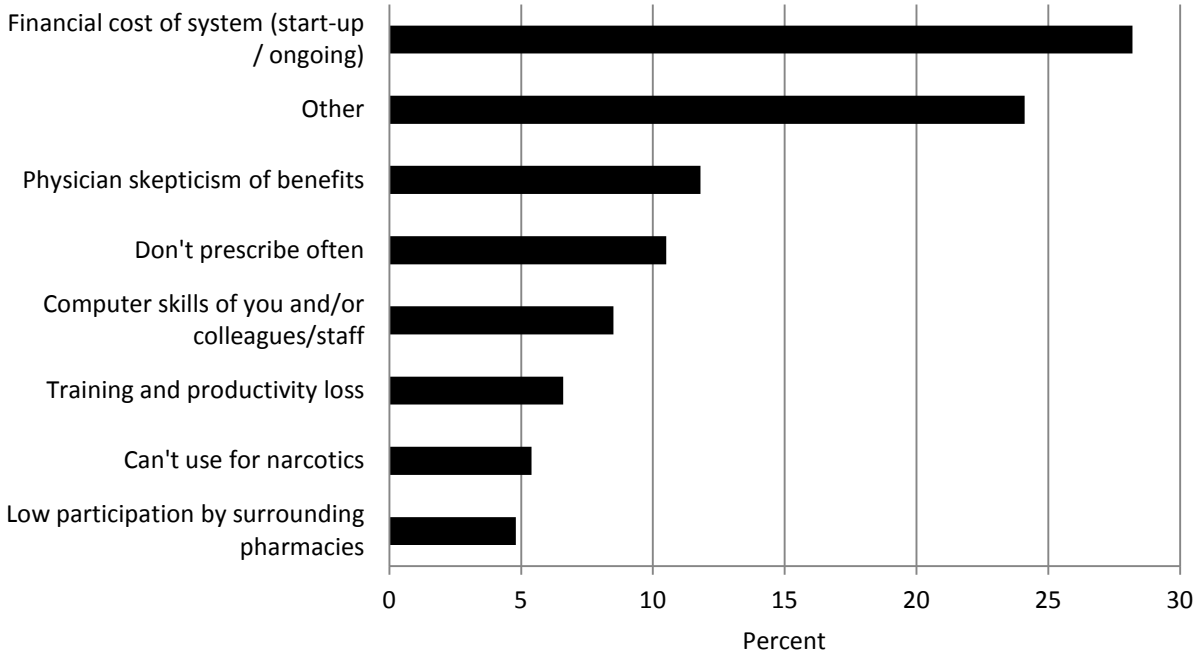


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Among those physicians not currently e-prescribing, nearly 80% plan to implement e-prescribing within the next two years. The top factors cited as the main reason for not adopting e-prescribing (see Figure 1.5) include start-up and maintenance costs of system (cited by 28.2%), physician skepticism regarding the benefits of e-prescribing (11.8%), and low use of prescribing in their specialty (10.5%).

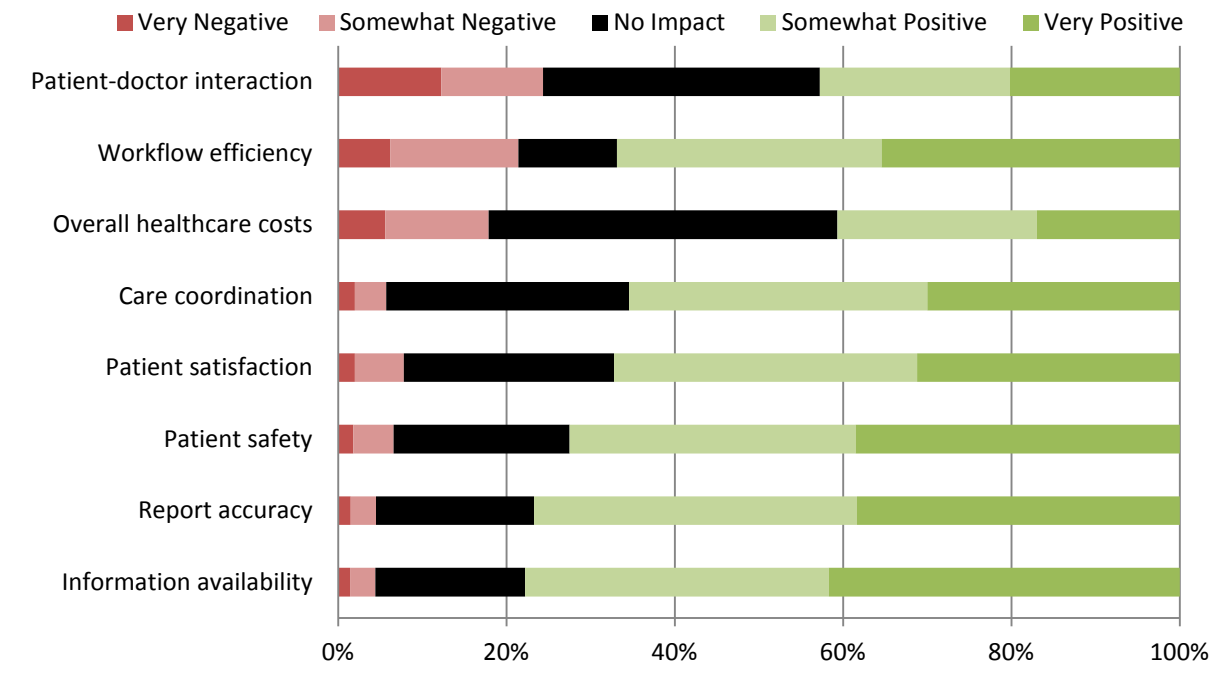
For the items used to assess the impact of e-prescribing on their practice (see Figure 1.6), across most measures, a large majority of physicians felt that e-prescribing would have a positive impact (range: 66.8% to 77.8%). This was especially true for information availability (77.8% reported a positive impact), report accuracy (76.8%), and patient safety (72.5%). The exceptions were the impact of e-prescribing on overall healthcare costs, where only 40.7% thought e-prescribing would have a positive impact, and on the patient-doctor interaction (47.1% positive).

Figure 1.5: Physicians - Main Reason for Not Adopting E-Prescribing



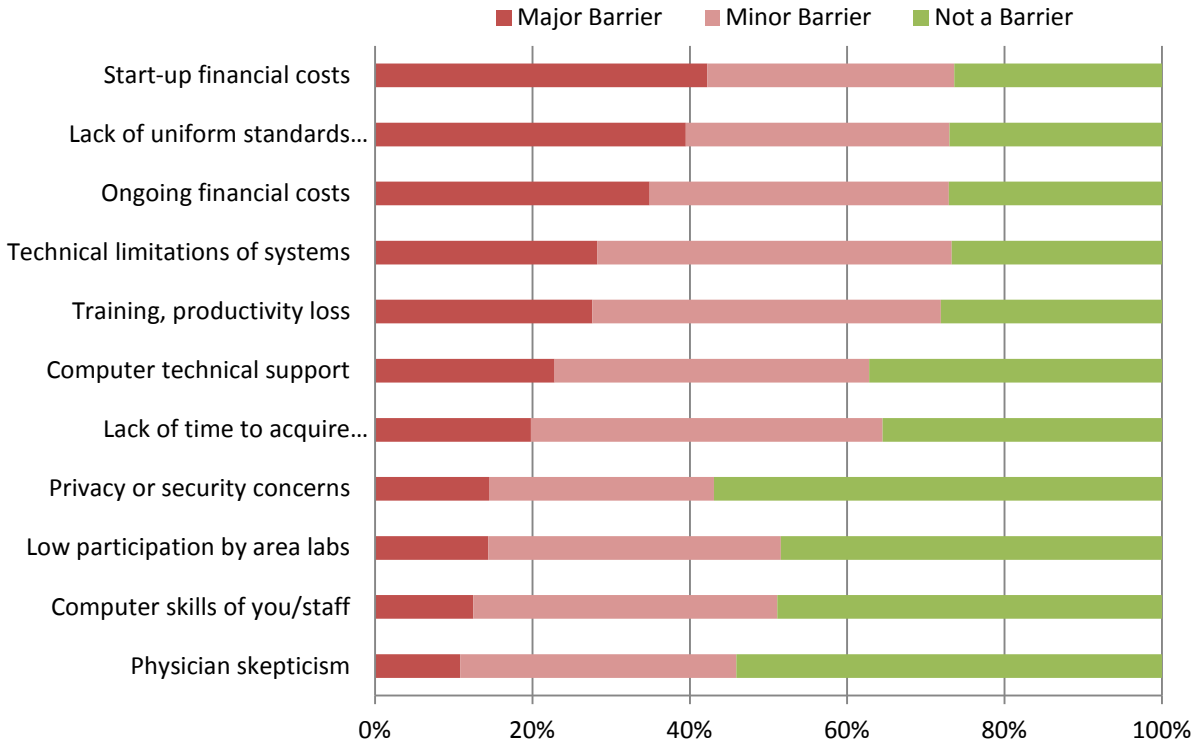
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.6: Physicians - Impact of E-Prescribing *(whether currently e-prescribing or not)*



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.7: Physicians - Barriers to Implementing or Expanding E-Prescribing
(whether currently e-prescribing or not)



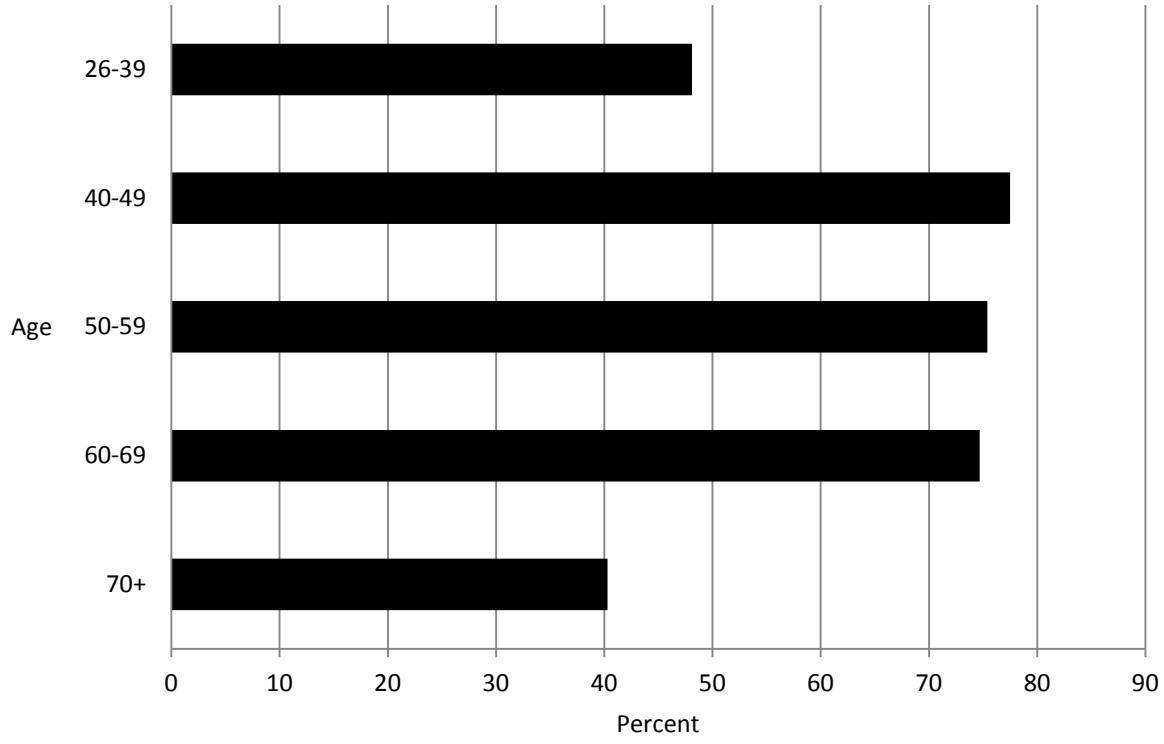
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For implementing or expanding e-prescribing in their practice (see Figure 1.7), start-up financial cost was the top barrier cited, with 42.2% of physicians saying it was a major barrier and another 31.4% saying it was a minor barrier. This was closely followed by technical limitations of systems (major barrier 28.2%, minor barrier 45.0%), lack of uniform standards within the industry (major barrier 39.5%, minor barrier 33.5%), ongoing financial costs (major barrier 34.9%, minor barrier 38.0%), and training and productivity loss (major barrier 27.6%, minor barrier 44.3%). Privacy or security concerns and physician skepticism were rarely cited as major barriers.

Cross-Tabulations by Physician Age, Practice Size, and Primary Specialty Groups

Physicians ages 70 and over (see Figure 1.8), solo physicians and those in very large practices, and specialists were significantly less likely to transmit prescriptions to pharmacies electronically.

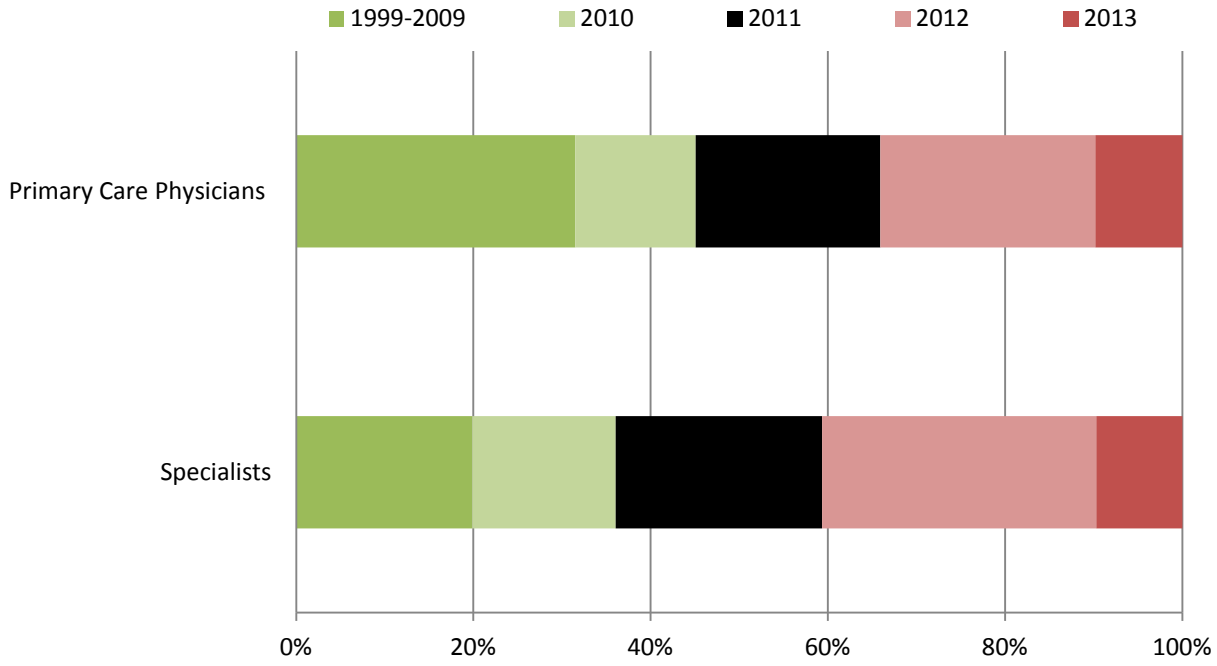
Figure 1.8: Physicians Who Transmit Prescriptions to Pharmacies Electronically by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

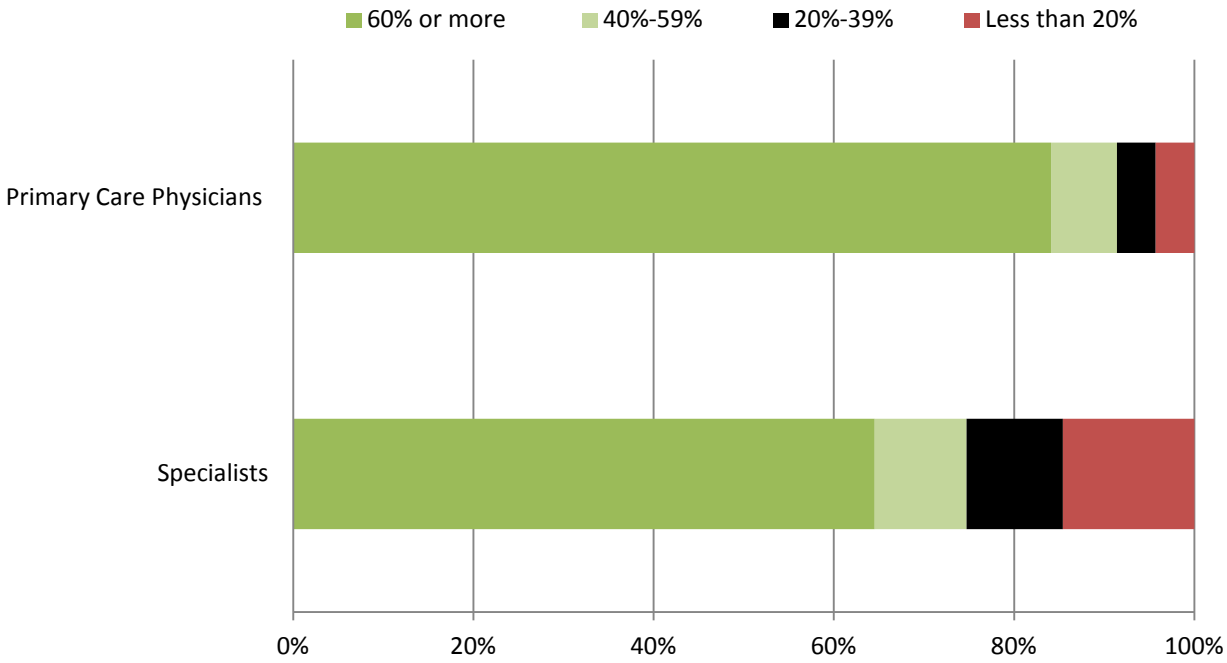
Primary care physicians were more likely to adopt e-prescribing earlier (see Figure 1.9) and to send 60% or more of their prescriptions electronically to a pharmacy (see Figure 1.10) as compared to specialists. Both primary care physicians and specialists were more likely to use an office EHR system and less likely to use an external web portal for e-prescribing. Also, as practice size increased, physicians were more likely to use an office EHR system (see Figure 1.11) and less likely to use an external web portal for e-prescribing. There were no significant differences by physician age for these measures.

Figure 1.9: Year That E-Prescribing Was First Implemented by Specialty



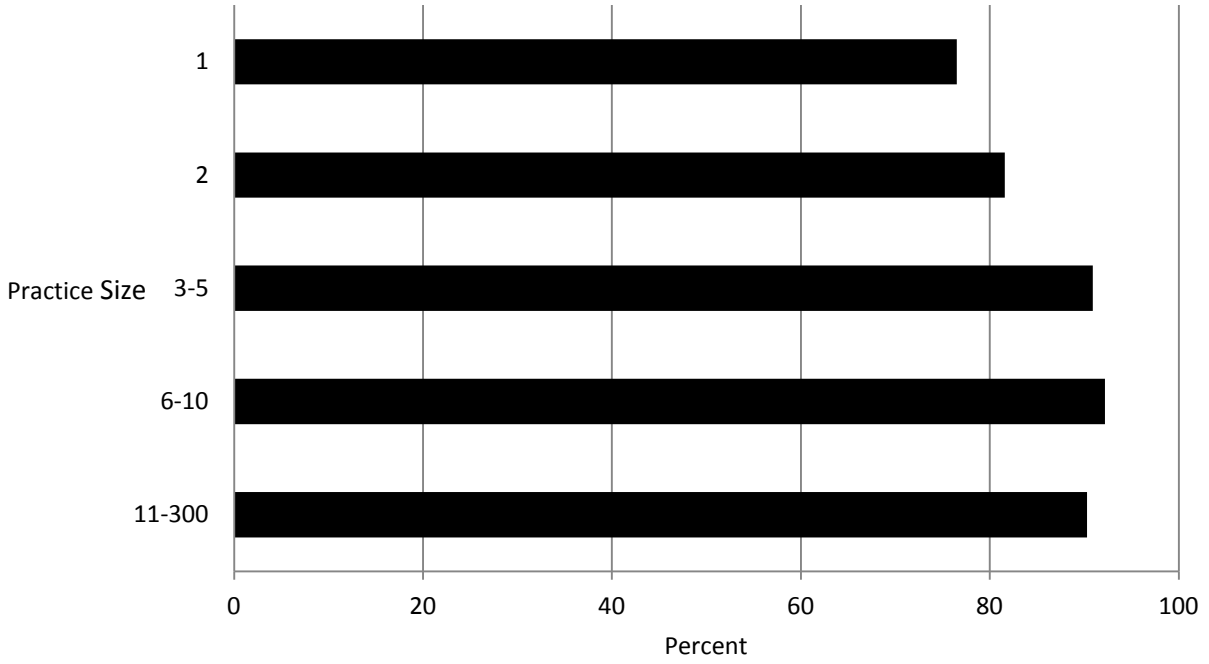
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.10: Percent of Prescriptions Sent Electronically to a Pharmacy by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

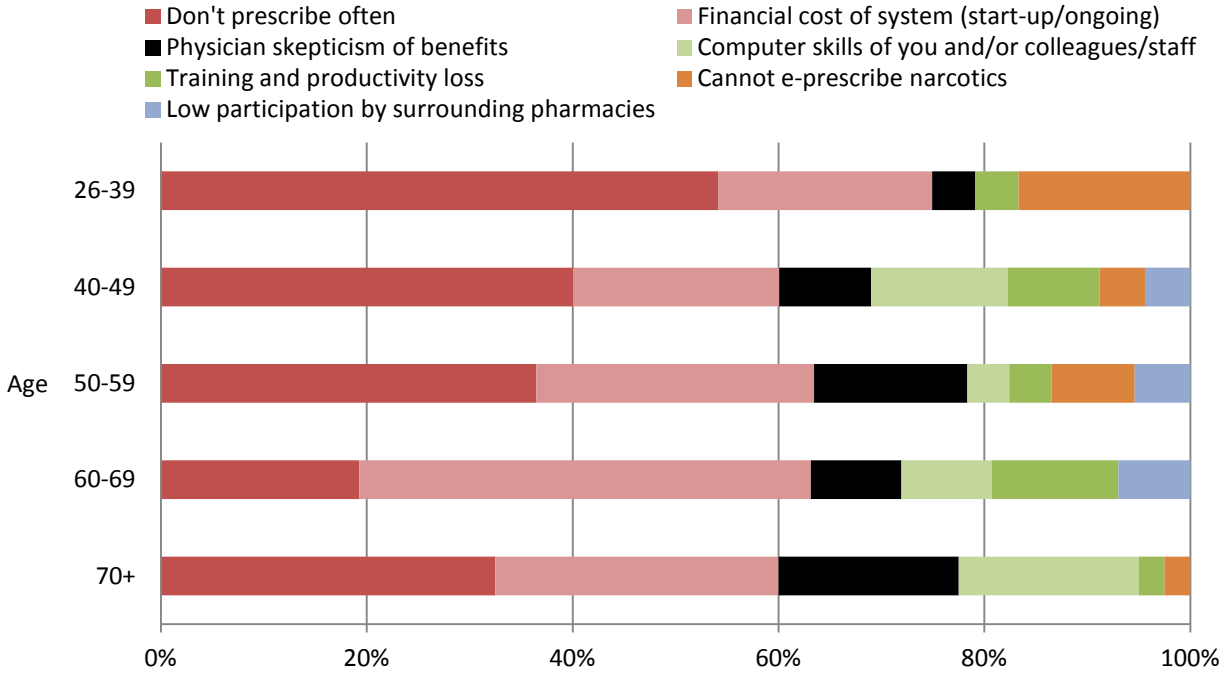
Figure 1.11: Percent Using an Office EHR System to E-Prescribe by Physician Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

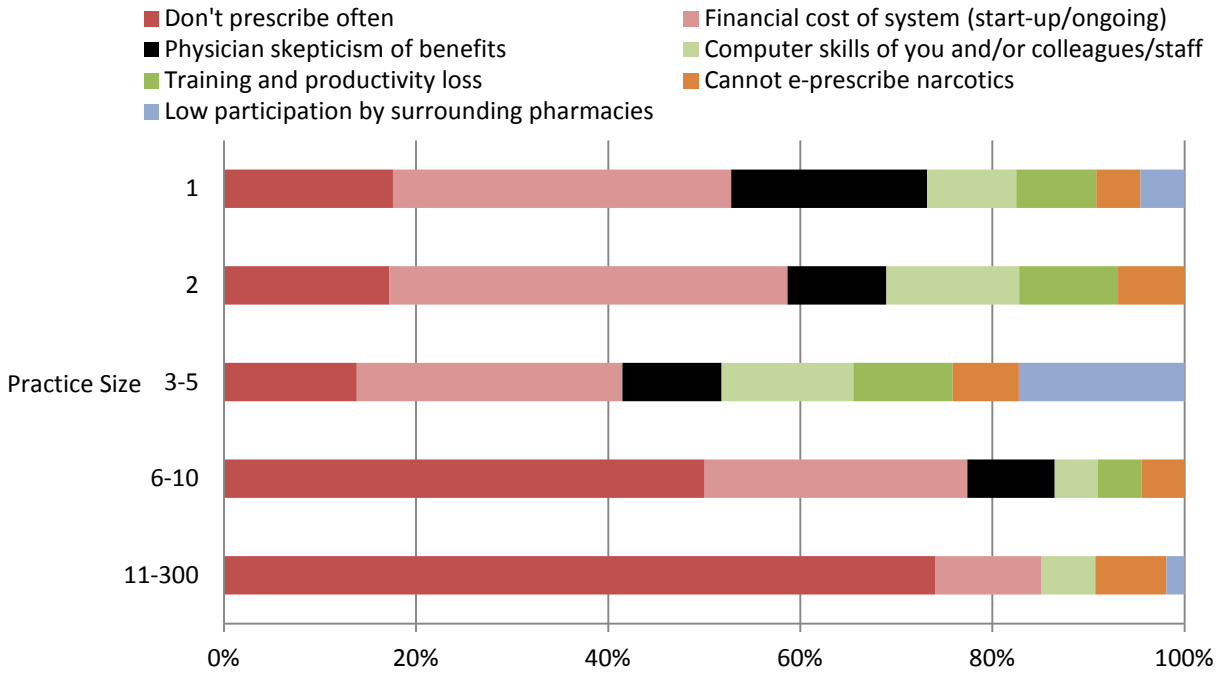
For the main reason for not adopting e-prescribing (see Figures 1.12-1.14), physicians 26-39 years old, large practice sizes (6 or more physicians), and specialists were less likely to e-prescribe due to the minimal use of prescribing generally in their specialty. Financial cost of the system was more likely to be reported as the main reason for not e-prescribing with increasing physician age (with the exception of physicians 70 and over), for smaller practice sizes (solo and 2-physician practices), and for primary care physicians.

Figure 1.12: Main Reason for Not Adopting E-Prescribing by Physician Age



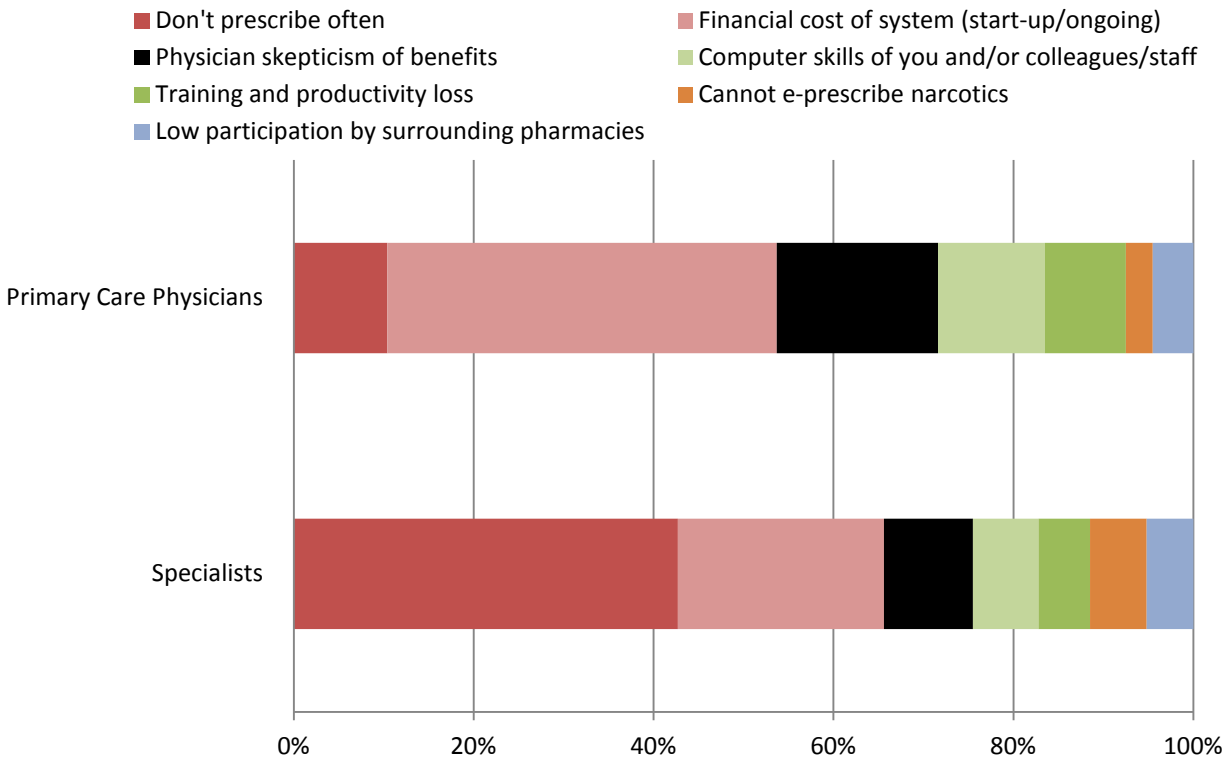
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.13: Main Reason for Not Adopting E-Prescribing by Physician Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

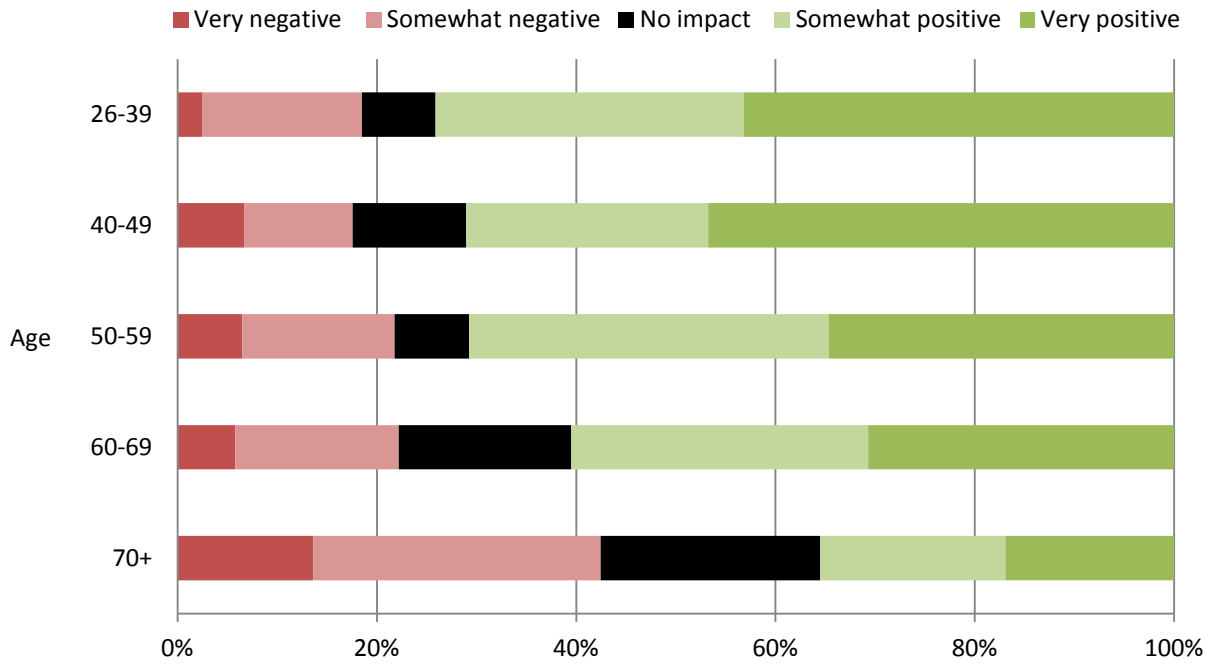
Figure 1.14: Main Reason for Not Adopting E-Prescribing by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

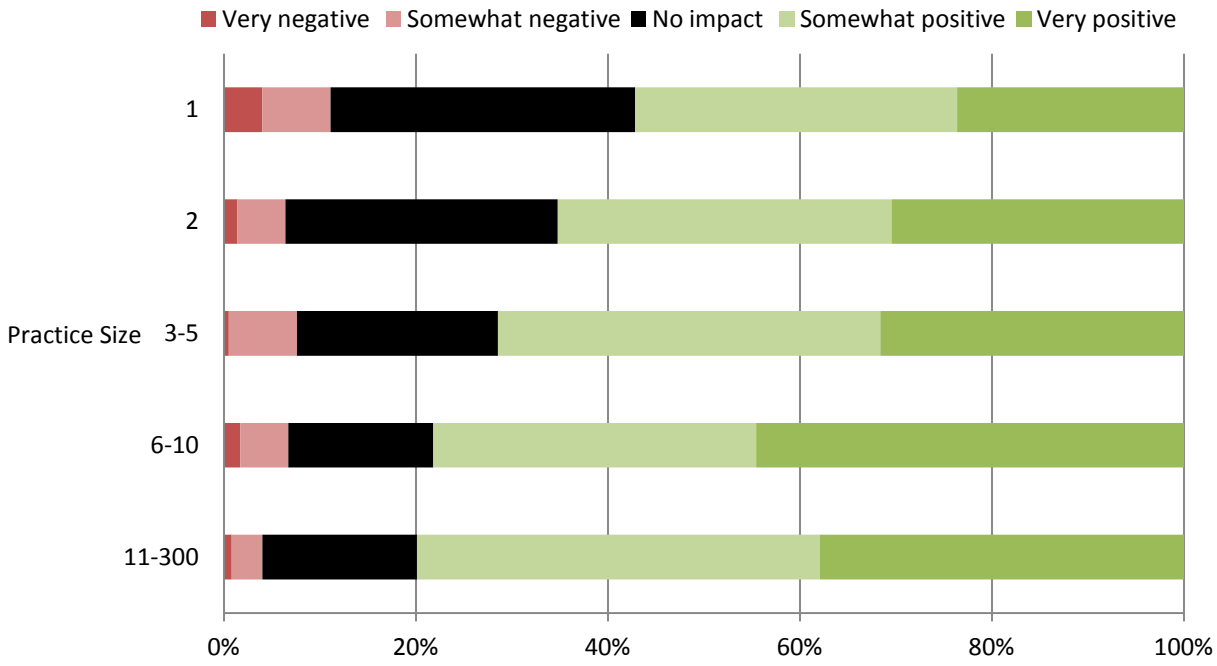
For the items regarding the impact of e-prescribing on their practice, as age increased, physicians were less likely to report a positive effect of e-prescribing on their practice (see Figure 1.15). With an increase in practice size, physicians were more likely to report a positive effect of e-prescribing on their practice (see Figure 1.16). Primary care physicians were more likely to report a positive impact of e-prescribing on their practice.

Figure 1.15: Effect of E-Prescribing on Practice Workflow Efficiency by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

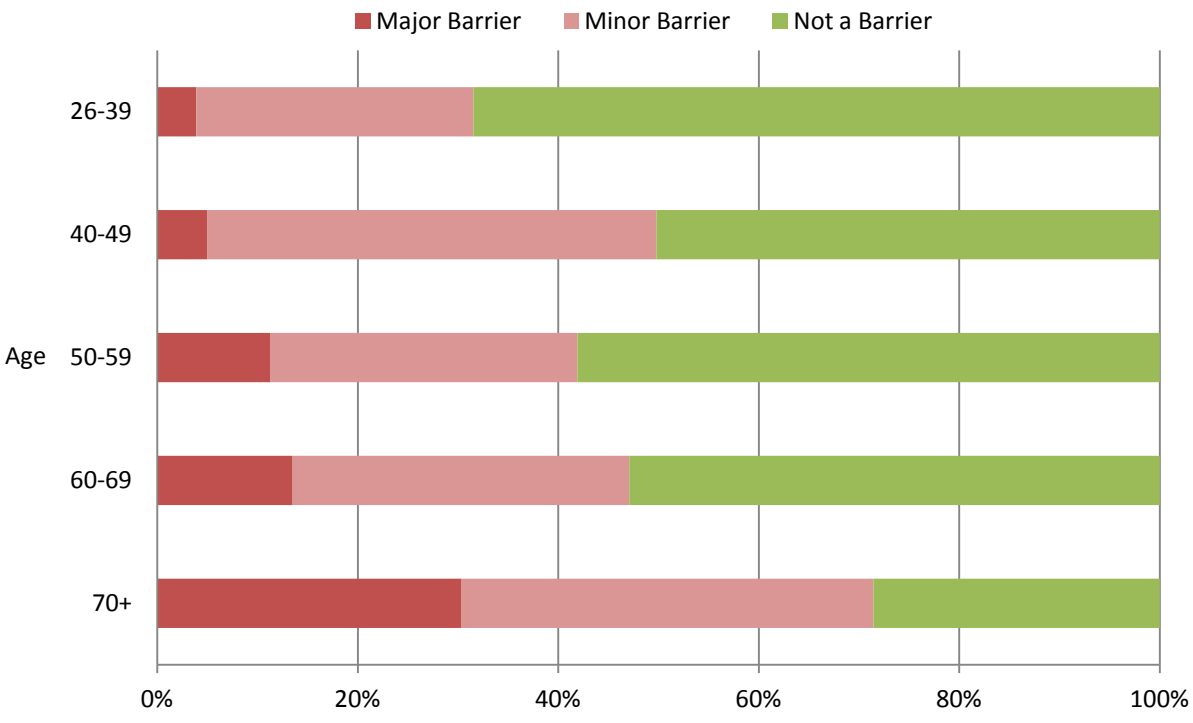
Figure 1.16: Effect of E-Prescribing on Patient Satisfaction by Physician Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For barriers to beginning or expanding e-prescribing on their practice, physician skepticism (see Figure 1.17), lack of time to acquire knowledge about systems, lack of uniform standards within the industry, and technical limitations of the system were more likely to be reported as minor or major barriers with increasing physician age. Privacy or security concerns were more likely to be reported as major barriers by older physicians. As practice size increased, computer skills of physician/staff were less likely to be reported as a major barrier. Computer technical support and privacy or security concerns were more likely to be reported as minor or major barriers by physicians in practice sizes with 6-10 physicians. Training and productivity loss were less likely to be reported as major or minor barriers by physicians in very large practice sizes. Physician skepticism and lack of time to acquire knowledge about the systems were more likely to be reported as major barriers by solo physicians. Primary care physicians were less likely to report lack of time to acquire knowledge about systems, low participation by area labs, and technical limitations of the systems as major or minor barriers.

Figure 1.17: Barriers to Implementing or Expanding the Use of E-Prescribing: Physician Skepticism of Benefits by Physician Age

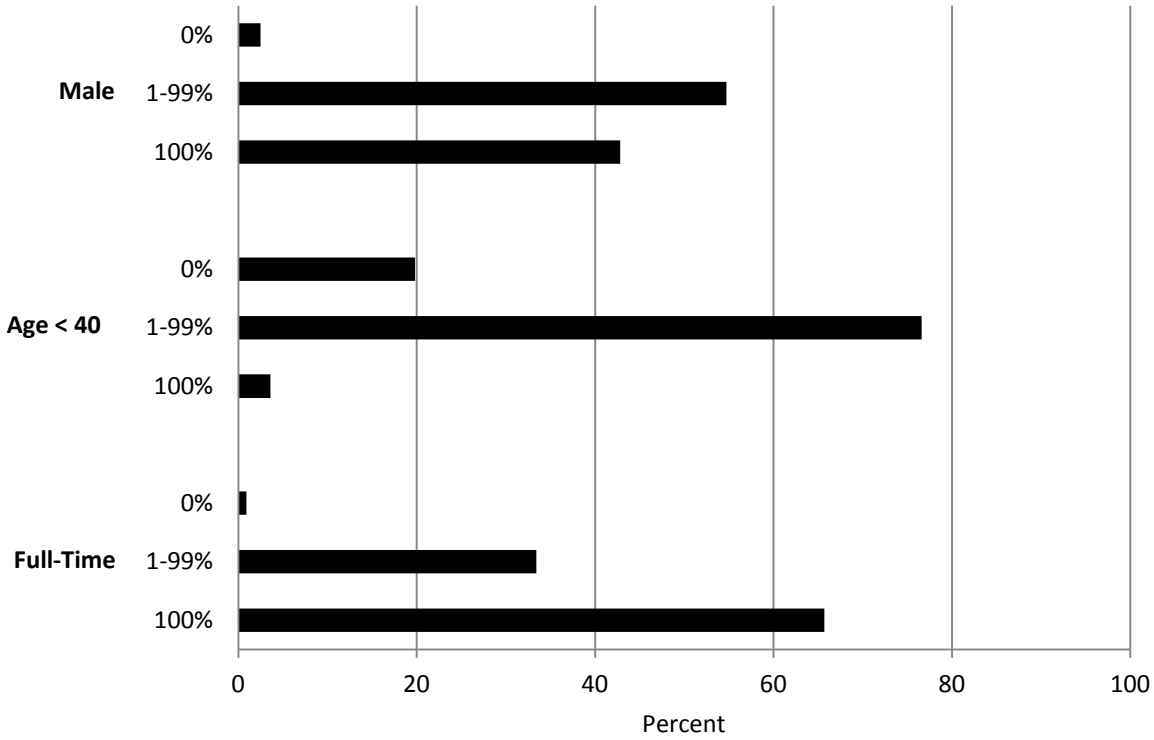


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Practice Characteristics

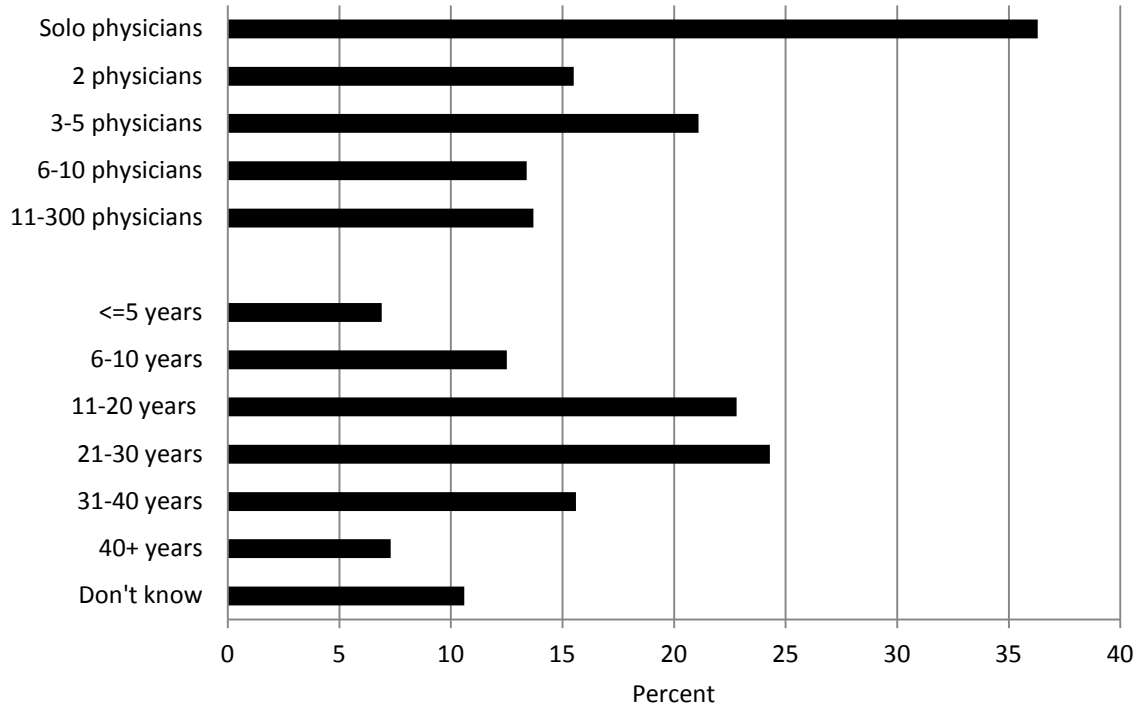
Practice characteristics are contained in Table 1.7 and Figures 1.18-1.19. The majority (85.3%) are single specialty practices. Caution should be used when interpreting estimates relating to the age, gender, and full-time versus part-time status of physicians in their practices (see Figure 1.18), and other health professionals in practice since large numbers (40-60% across the items) of respondents left these items blank. Over four in 10 practices (42.8%) consist of 100% male physicians, and 18.7% consist of 100% female physicians. Only 3.6% consist of all physicians being under the age of 40, while 35.8% of practices consist of all physicians being ages 40-59 and 24.2% consist of all physicians in the practice being age 60 or older. Nearly two-thirds (65.7%) of practices consist of all full-time physicians, and 9.6% of practices consist of all part-time physicians. For other types of health professionals on staff in their practice, 20.4% have at least one nurse practitioner and 12.8% have at least one physician assistant. For practice size, just over half have 1-2 physicians (1: 36.3%, 2: 15.5%), 21.1% have 3-5 physicians, 13.4% have 6-10 physicians, and 13.7% have 11-300 physicians (see Figure 1.19). Most practices had been in operation for either 11-20 years (22.8%) or 21-30 years (24.3%) (see Figure 1.19).

Figure 1.18: Physicians - Demographics of Practice



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.19: Physicians – Practice Size and Years Practice in Operation

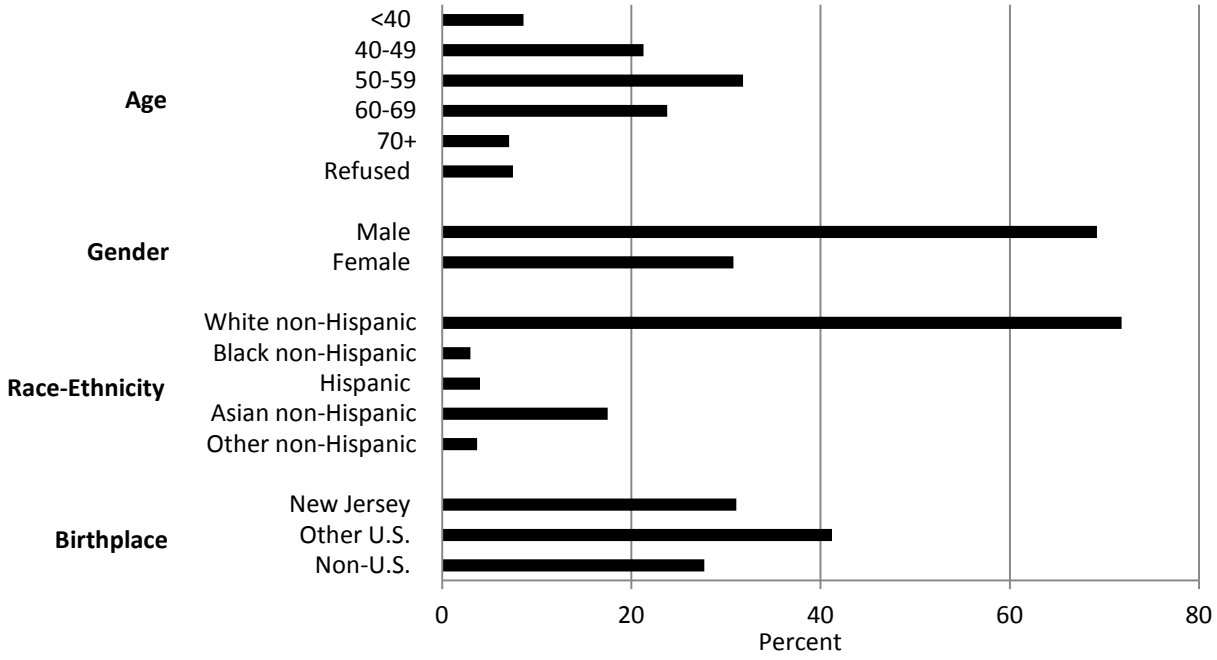


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Physician Characteristics

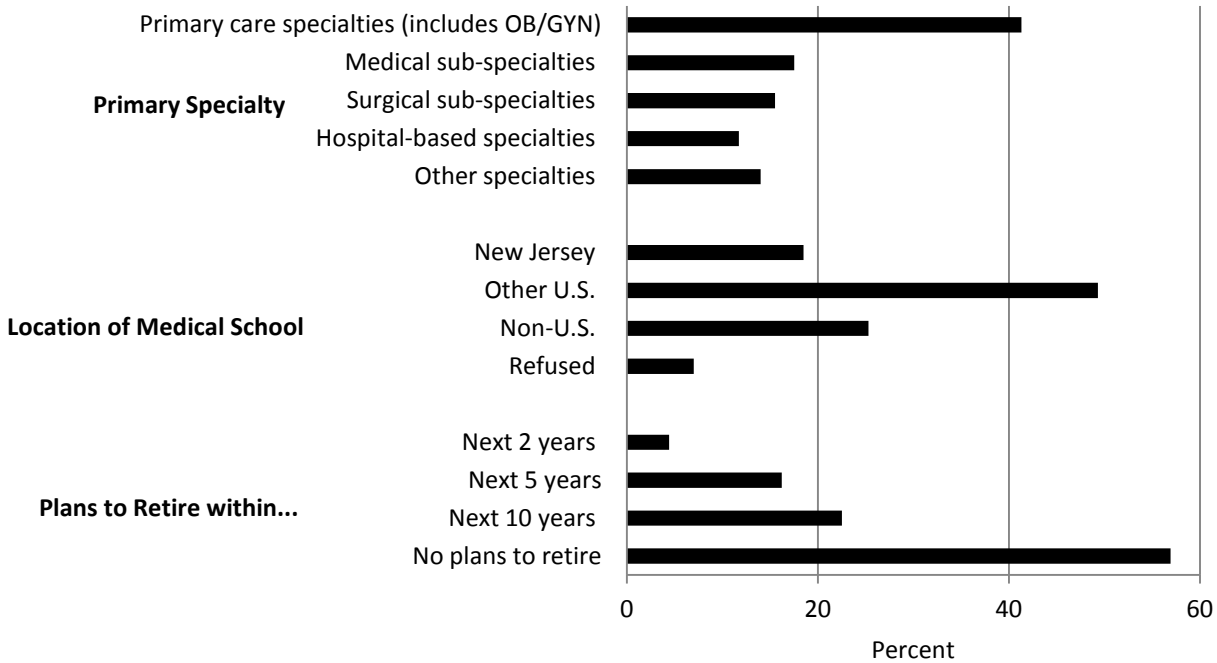
Physician characteristics are contained in Table 1.8 and Figures 1.20-1.22. Physicians were most likely to be ages 50-59 (31.8%). About 7 in 10 (69.2%) physicians were male and, similarly, most (71.8%) were white non-Hispanic, followed by Asian non-Hispanic (17.5%). Just over 40% (41.3%) were in primary care specialties (includes OB/GYN), with the remaining fairly evenly distributed over the medical sub-specialties, surgical sub-specialties, hospital-based specialties, and other specialties (11.7%-17.5%). Nearly a third (31.1%) were born in New Jersey, and over a fourth (27.7%) were born outside the United States. Nearly one in five (18.5%) went to medical school in New Jersey and about a fourth went to medical school outside the United States. About three-fourths (74.1% and 74.6%, respectively) of physicians reported that less than 10% of their patients were covered by either Medicaid or NJ FamilyCare or were uninsured. Similarly, only 31.8% of physicians are accepting new Medicaid patients, 29.4% are accepting new NJ FamilyCare patients, and 28.9% are accepting new patients with insurance obtained through the ACA marketplace. However, 65.2% of physicians are accepting new uninsured patients who pay with cash. One in five (20.6%) physicians plans to retire within the next five years, and 22.5% more plan to retire within 10 years. The survey questionnaire was primarily completed by the physician (84.6%) or the office manager (13.7%).

Figure 1.20: Physician Characteristics



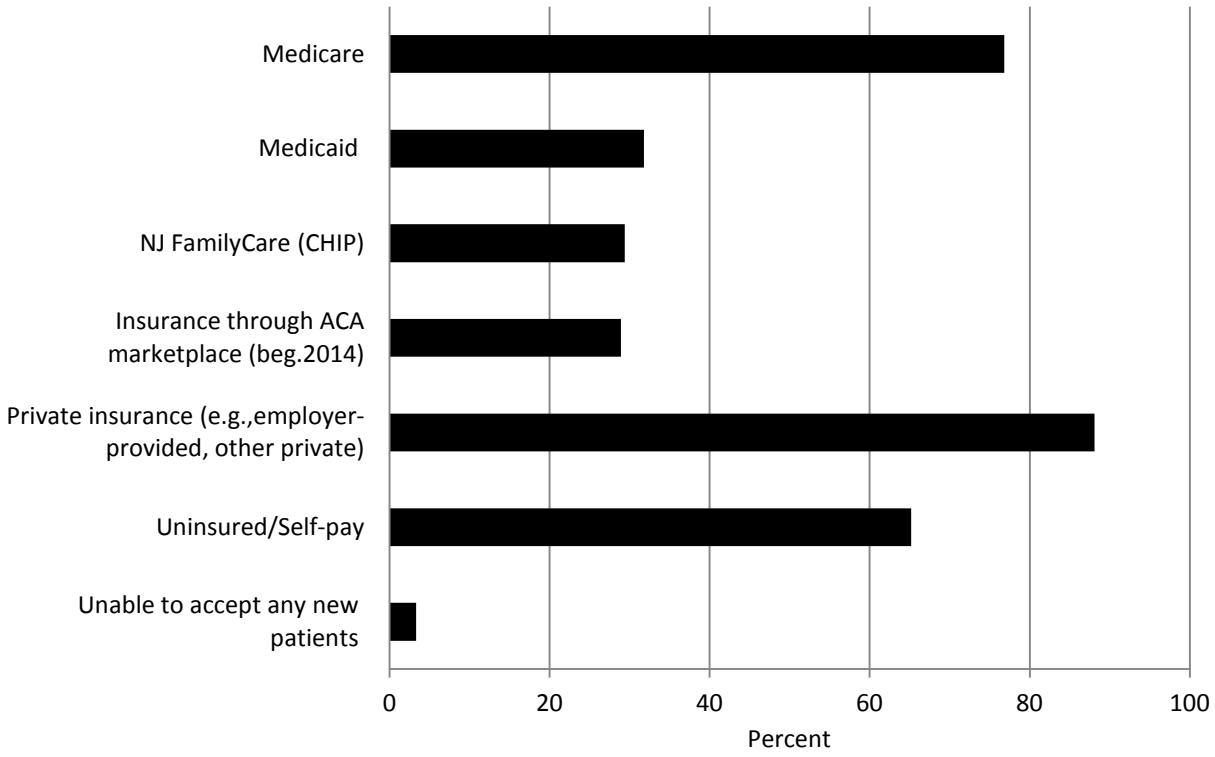
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.21: Physician Characteristics *(continued)*



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 1.22: Physicians - Accepting New Patients with Following Payer



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Conclusions

Nearly three-fourths (72.5%) of physicians are currently transmitting prescriptions to pharmacies electronically. Of these, about a quarter (26.9%) implemented e-prescribing before 2010; implementation increased steadily from 2010 to 2012, with a slight drop-off in 2013. Among those currently e-prescribing, the vast majority (74.0%) use e-prescribing for at least 60% of all their prescription orders. The most common method of e-prescribing is via an office EHR system (84.0%). Most of the remaining (15.9%) use an external web portal.

Among those physicians not currently e-prescribing, nearly 80% plan to implement e-prescribing within the next two years. The main reasons for not adopting e-prescribing included start-up and maintenance costs of the system, physician skepticism regarding the benefits of e-prescribing, and low use of prescribing in their specialty.

Across most measures, a large majority of physicians felt that e-prescribing would have a positive impact on their practice (66.8% to 77.8%). This was especially true for information availability (77.8% reported a positive impact), report accuracy (76.8%), and patient safety

(72.5%). The exceptions were the impact of e-prescribing on overall healthcare costs, where only 40.7% thought e-prescribing would have a positive impact, and on the patient-doctor interaction (47.1% positive).

For implementing or expanding e-prescribing in their practice, start-up financial cost was the top barrier cited, with 42.2% of physicians saying it was a major barrier and another 31.4% said it was a minor barrier. This was closely followed by technical limitations of systems, lack of uniform standards within the industry, ongoing financial costs, and training and productivity loss. Privacy or security concerns and physician skepticism were rarely cited as major barriers.

Physicians ages 70 and over, solo physicians and those in very large practices, and specialists were significantly less likely to transmit prescriptions to pharmacies electronically. Primary care physicians were more likely to adopt e-prescribing earlier and to send 60% or more of their prescriptions electronically to a pharmacy. Primary care physicians, specialists and larger practices were more likely to use an office EHR system.

Among the physicians not currently e-prescribing, younger physicians, large practice sizes (6 or more physicians), and specialists were less likely to e-prescribe due to the minimal use of prescribing generally in their specialty. Older physicians (with the exception of physicians 70 and over), smaller practices, and primary care physicians were more likely to report financial cost of the system as the main reason for not e-prescribing.

Primary care physicians, younger physicians, and larger practices were more likely to report a positive impact of e-prescribing on their practice.

Across most barrier measures, older physicians were more likely and larger practice sizes were less likely to report beginning or expanding e-prescribing as a barrier for their practice. Physician skepticism and lack of time to acquire knowledge about systems were more likely to be reported as major barriers by solo physicians. Primary care physicians were less likely to report lack of time to acquire knowledge about systems, low participation by area labs, and technical limitations of the systems as major or minor barriers.

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Table 1.1: Item Frequencies, Pharmacy Characteristics, Level of Health IT Understanding, and Implementation Plans for Non-E-Prescribing NJ Pharmacies

	N	%
Total	**19**	**100.0**
Type of pharmacy		
Chain	0	0.0
Government	0	0.0
Franchise	0	0.0
Alternate dispensing site	12	63.2
Independent	7	36.8
Other	0	0.0
Prescription dispensing volume per day		
0-50 per day	7	36.8
51-100 per day	6	31.6
Over 100 per day	6	31.6
Level of health IT understanding		
No or little knowledge	11	57.9
Moderate to high understanding	8	42.1
Plans to implement electronic prescribing		
Yes	3	15.8
No	16	84.2
How soon plan to implement?		
Within 6 months	0	0.0
6 months - 1 year	1	33.3
1 year - 2 years	1	33.3
More than 2 years	1	33.3

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.2: Item Frequencies, Barriers to Implementing Electronic Prescribing

	Barriers to Implementation	
	N	%
Total	**16**	**100.0**
Start-up costs		
Not a barrier	5	31.3
Minor barrier	1	6.3
Major barrier	10	62.5
Converting existing data into e-prescribing system		
Not a barrier	3	18.8
Minor barrier	8	50.0
Major barrier	5	31.3
Maintenance costs		
Not a barrier	4	25.0
Minor barrier	5	31.3
Major barrier	7	43.8
Potential for an incomplete patient medication list		
Not a barrier	6	37.5
Minor barrier	7	43.8
Major barrier	3	18.8
Changes to existing workflow		
Not a barrier	4	25.0
Minor barrier	7	43.8
Major barrier	5	31.3
Electronic prescription transaction fees		
Not a barrier	5	31.3
Minor barrier	3	18.8
Major barrier	8	50.0
Low physician e-prescriber activity in the area		
Not a barrier	5	31.3
Minor barrier	6	37.5
Major barrier	5	31.3

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.2: Item Frequencies, Barriers to Implementing Electronic Prescribing

(continued)

	Barriers to Implementation	
	N	**%**
Network connections in the area		
Not a barrier	8	50.0
Minor barrier	7	43.8
Major barrier	1	6.3
Network costs		
Not a barrier	6	37.5
Minor barrier	4	25.0
Major barrier	6	37.5
Bugs in e-prescribing process		
Not a barrier	5	31.3
Minor barrier	4	25.0
Major barrier	7	43.8
Concerns about security of patient data		
Not a barrier	4	25.0
Minor barrier	6	37.5
Major barrier	6	37.5
Concerns about privacy of patient data		
Not a barrier	4	25.0
Minor barrier	6	37.5
Major barrier	6	37.5
Impact on "impulse-buy" sales		
Not a barrier	11	68.8
Minor barrier	3	18.8
Major barrier	2	12.5
Planning to retire soon		
Not a barrier	11	73.3
Minor barrier	2	13.3
Major barrier	2	13.3

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.3: Item Frequencies, Most Important Barrier to Implementing Electronic Prescribing

	Most Important Barrier	
	N	%
Total	**16**	**100**
Start-up costs	6	37.5
Converting existing data into e-prescribing system	2	12.5
Maintenance costs	1	6.3
Potential for an incomplete patient medication list	0	0.0
Changes to existing workflow	0	0.0
E-prescription transaction fees	1	6.3
Low physician e-prescriber activity in the area	0	0.0
Network connections in the area	0	0.0
Network costs	0	0.0
Bugs in e-prescribing process	1	6.3
Concerns about security of patient data	0	0.0
Concerns about privacy of patient data	2	12.5
Impact on “impulse-buy” sales	0	0.0
Planning to retire soon	2	12.5
Other	1	6.3

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.4: Item Frequencies, Effect of E-Prescribing on Pharmacy Practice

	Pharmacy	
	N	%
Total	**19**	**100.0**
Efficiency		
Very/somewhat negative	4	21.1
No effect	7	36.8
Somewhat/very positive	8	42.1
Safety		
Very/somewhat negative	6	31.6
No effect	8	42.1
Somewhat/very positive	5	26.3
Patient-centeredness		
Very/somewhat negative	4	21.1
No effect	9	47.4
Somewhat/very positive	6	31.6
Effectiveness		
Very/somewhat negative	6	31.6
No effect	7	36.8
Somewhat/very positive	6	31.6
Timeliness		
Very/somewhat negative	4	21.1
No effect	6	31.6
Somewhat/very positive	9	47.4
Access to patient medication history		
Very/somewhat negative	4	21.1
No effect	9	47.4
Somewhat/very positive	6	31.6
Convenience		
Very/somewhat negative	4	21.1
No effect	7	36.8
Somewhat/very positive	8	42.1

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.4: Item Frequencies, Effect of E-Prescribing on Pharmacy Practice

(continued)

	Pharmacy	
	N	**%**
Communication with the patient		
Very/somewhat negative	4	21.1
No effect	12	63.2
Somewhat/very positive	3	15.8
Communication with the physician		
Very/somewhat negative	7	36.8
No effect	4	21.1
Somewhat/very positive	8	42.1
Overall relations with the patient		
Very/somewhat negative	4	21.1
No effect	12	63.2
Somewhat/very positive	3	15.8

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.5: Item Frequencies, Estimated Physician Adoption Rate of E-Prescribing, Pharmacy Implementation Plan and HIO Awareness for Non-E-Prescribing NJ Pharmacies

	N	%
Total	**19**	**100.0**
Estimated current physician adoption of e-prescribing in area		
0%	7	36.8
1-20%	3	15.8
21-40%	5	26.3
41-60%	1	5.3
61-80%	0	0.0
81-100%	0	0.0
Don't know	3	15.8
Level of physician e-Rx participation that would prompt to implement		
1-20%	0	0.0
21-40%	2	11.8
41-60%	5	29.4
61-80%	2	11.8
81-100%	3	17.6
Will only accept written or call-in prescriptions	5	29.4
E-Rx implementation a priority		
Yes	1	5.3
No	18	94.7
Perceived time savings of E-Rx		
Yes	9	50.0
No	9	50.0
Aware of NJ HIOs in the area		
Yes	1	5.3
No	18	94.7
Interested in participating in an HIO		
Yes	1	5.3
No	18	94.7

Source: 2013-2014 New Jersey Pharmacy Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 1.6: Item Frequencies, Section A: Physician Use of E-Prescribing

	N	%
Total	**958**	**100.0**
Physicians that DO e-prescribe from main practice location	**691**	**72.5**
When e-prescribing first implemented		
2000-2009	84	26.9
2010	43	13.9
2011	47	15.2
2012	75	24.2
2013	62	19.8
% of prescription orders sent electronically		
<20%	66	9.6
20-39%	52	7.6
40-59%	61	8.8
60%+	511	74.0
Mode used for e-prescribing		
Office EHR system	581	84.0
External web portal	110	15.9
Email	9	1.2
Other	20	2.9
Physicians that DO NOT e-prescribe from main practice location	**262**	**27.5**
Plans to implement e-prescribing in near future	**61**	**25.0**
In 2014	35	58.3
In 2015	12	19.7
After 2015	11	17.1
Main reason for not adopting e-prescribing		
Financial cost of system (start-up / ongoing)	73	28.2
Low participation by surrounding pharmacies	12	4.8
Computer skills of you and/or colleagues/staff	22	8.5
Training and productivity loss	17	6.6
Physician skepticism of benefits	30	11.8
Don't prescribe often	27	10.5
Can't use for narcotics	14	5.4
Other	62	24.1

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.6: Item Frequencies, Section A: Physician Use of E-Prescribing

(continued)

	N	%
Impact of e-prescribing (whether currently e-prescribing or not)		
Workflow efficiency		
Very positive	330	35.4
Somewhat positive	293	31.4
No impact	110	11.7
Somewhat negative	142	15.2
Very negative	58	6.2
Patient safety		
Very positive	358	38.5
Somewhat positive	316	34.0
No impact	195	20.9
Somewhat negative	44	4.8
Very negative	17	1.8
Overall healthcare costs		
Very positive	156	17.0
Somewhat positive	217	23.7
No impact	380	41.5
Somewhat negative	112	12.3
Very negative	51	5.6
Report accuracy		
Very positive	357	38.4
Somewhat positive	356	38.4
No impact	175	18.8
Somewhat negative	28	3.0
Very negative	14	1.5
Information availability		
Very positive	384	41.7
Somewhat positive	332	36.1
No impact	164	17.8
Somewhat negative	27	3.0
Very negative	13	1.4
Care coordination		
Very positive	279	30.0
Somewhat positive	329	35.5
No impact	268	28.9
Somewhat negative	34	3.7
Very negative	18	2.0

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.6: Item Frequencies, Section A: Physician Use of E-Prescribing

(continued)

	N	%
Patient satisfaction		
Very positive	291	31.2
Somewhat positive	335	36.0
No impact	233	25.0
Somewhat negative	54	5.8
Very negative	19	2.0
Patient-doctor interaction		
Very positive	206	22.2
Somewhat positive	232	24.9
No impact	336	36.2
Somewhat negative	123	13.3
Very negative	32	3.5
Barriers to implementing or expanding e-prescribing (whether currently e-prescribing or not)		
Computer skills of you/staff		
Not a barrier	452	48.9
Minor barrier	356	38.6
Major barrier	116	12.5
Computer technical support		
Not a barrier	344	37.2
Minor barrier	370	40.0
Major barrier	211	22.8
Privacy or security concerns		
Not a barrier	520	57.0
Minor barrier	261	28.6
Major barrier	132	14.5
Start-up financial costs		
Not a barrier	241	26.4
Minor barrier	287	31.4
Major barrier	385	42.2
Ongoing financial costs		
Not a barrier	247	27.1
Minor barrier	347	38.0
Major barrier	318	34.9

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.6: Item Frequencies, Section A: Physician Use of E-Prescribing

(continued)

	N	%
Training, productivity loss		
Not a barrier	259	28.1
Minor barrier	408	44.3
Major barrier	254	27.6
Physician skepticism		
Not a barrier	491	54.1
Minor barrier	319	35.1
Major barrier	98	10.8
Lack of time to acquire knowledge about systems		
Not a barrier	321	35.5
Minor barrier	406	44.7
Major barrier	180	19.8
Low participation by area labs		
Not a barrier	424	48.5
Minor barrier	326	37.2
Major barrier	126	14.4
Lack of uniform standards within industry (multiple systems)		
Not a barrier	241	27.0
Minor barrier	298	33.5
Major barrier	351	39.5
Technical limitations of systems		
Not a barrier	239	26.7
Minor barrier	402	45.0
Major barrier	252	28.2

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.7: Item Frequencies, Section F: Main NJ Practice Characteristics

	N	%
Total	**958**	**100.0**
Practice size		
Solo physician	337	36.3
2 physicians	144	15.5
3-5 physicians	196	21.1
6-10 physicians	125	13.4
11-300 physicians	128	13.7
Practice specialty		
Single specialty practice	795	85.3
Multi-specialty practice	137	14.7
Demographics of physicians in practice		
100% male physicians	292	42.8
100% female physicians	101	18.7
100% physicians ages <40	14	3.6
100% physicians ages 40-59	217	35.8
100% physicians ages 60+	117	24.2
100% full-time physicians	357	65.7
100% part-time physicians	35	9.6
Number other health professionals in main NJ practice		
Nurse practitioners		
0	425	44.4
1	100	10.4
2+	96	10.0
Missing, Don't know	337	35.2
Clinical nurse specialists		
0	451	47.0
1	24	2.5
2+	32	3.5
Missing, Don't know	451	47.0

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.7: Item Frequencies, Section F: Main NJ Practice Characteristics

(continued)

	N	%
Certified nurse midwives		
0	465	48.6
1	4	0.5
2+	9	0.8
Missing, Don't know	480	50.1
Certified registered nurse anesthetists		
0	468	48.9
1	3	0.3
2+	28	2.9
Missing, Don't know	459	47.9
Physician assistants		
0	442	46.2
1	54	5.6
2+	69	7.2
Missing, Don't know	393	41.0
Years practice in operation		
<=5	66	6.9
6-10	119	12.5
11-20	218	22.8
21-30	233	24.3
31-40	149	15.6
40+	70	7.3
Don't know	102	10.6

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.8: Item Frequencies, Section G: Physician Characteristics

	N	%
Total	**958**	**100.0**
Age		
<40	82	8.6
40-49	204	21.3
50-59	305	31.8
60-69	228	23.8
70+	68	7.1
Refused	72	7.5
Gender		
Male	648	69.2
Female	289	30.8
Race-ethnicity		
White non-Hispanic	655	71.8
Black non-Hispanic	27	3.0
Hispanic	36	4.0
Asian non-Hispanic	160	17.5
Other non-Hispanic	34	3.7
Primary Specialty		
Primary care specialties (includes OB/GYN)	396	41.3
Medical sub-specialties	168	17.5
Surgical sub-specialties	148	15.5
Hospital-based specialties	112	11.7
Other specialties	134	14.0
Birthplace		
New Jersey	291	31.1
Other U.S.	385	41.2
Non-U.S.	259	27.7

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.8: Item Frequencies, Section G: Physician Characteristics

(continued)

	N	%
Location of medical school		
New Jersey	177	18.5
Other U.S.	472	49.3
Non-U.S.	242	25.3
Refused	67	7.0
Patient payer mix		
Medicare		
None	92	9.6
1-10%	109	11.4
11-20%	139	14.5
21-40%	241	25.2
41-60%	209	21.8
61-100%	71	7.4
Refused	97	10.2
Medicaid/NJ FamilyCare		
None	274	28.6
1-10%	341	45.5
11-20%	70	7.3
21-40%	68	7.1
41-60%	41	4.3
61-100%	25	2.6
Refused	139	14.5
Uninsured/Self-pay		
None	48	5.0
1-10%	667	69.6
11-20%	67	7.0
21-40%	31	3.2
41-60%	14	1.4
61-100%	13	1.4
Refused	119	12.4

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 1.8: Item Frequencies, Section G: Physician Characteristics

(continued)

	N	%
All others (e.g., employer-provided, private, workers' comp, etc.)		
None	20	2.0
1-10%	70	7.4
11-20%	68	7.1
21-40%	206	21.5
41-60%	235	24.6
61-100%	245	25.6
Refused	113	11.8
Accepting new patients with following payer		
Medicare	736	76.8
Medicaid	304	31.8
NJ FamilyCare (CHIP)	281	29.4
Insurance through ACA marketplace *(beg. 2014)*	277	28.9
Private insurance (e.g.,employer-provided, other private)	844	88.1
Uninsured/Self-pay	625	65.2
Unable to accept any new patients	32	3.3
Plans to retire within…		
Next 2 years	40	4.4
Next 5 years	149	16.2
Next 10 years	207	22.5
No plans to retire	523	56.9
Survey questionnaire completed by		
Physician	811	84.6
Other medical professional (NP, PA, etc.)	6	0.6
Office manager/Administrator	132	13.7
Medical assistant	6	0.6
IT staff	4	0.4

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Chapter 2: Electronic Lab Requests/Results: An Analysis of the 2013-2014 NJ Health IT Hospital and Clinical Laboratory Survey and the 2013 Physician Survey

Introduction

In this chapter, we examine the benefits of and barriers to electronic laboratory requests/results delivery by NJ clinical labs and the use of electronic laboratory requests/results delivery by active, office-based physicians with a main office location in NJ. Some of the potential benefits of exchanging electronic laboratory results among health care organizations include alerts to clinicians to lab values outside of normal ranges (Jamoom et al. 2012) and the ability to better manage incoming lab results, identify and target groups of patients with abnormal results for follow-up care, order fewer tests (Hebel et al. 2012), identify and order needed tests, and improve care coordination (HealthIT.gov 2014). Technical challenges and lack of standards in transforming unstructured lab results into a structured format that can be incorporated into an EHR system and exchanged among providers and laboratories have previously been noted (Lewin Group 2009). A recent journal article examined a nationally representative sample of direct patient care office-based physicians in 2011. According to their findings, 67% (55% in NJ) of physicians had the capability to view lab results electronically, 42% (28% in NJ) were able to incorporate lab results into their EHR system and 35% (22% in NJ) were able to send lab orders electronically (Patel et al. 2013).

The meaningful use objectives for Stage 1 contain one menu set objective directly related to the use of electronic lab results by providers. It requires eligible professionals to incorporate clinical lab-test results into EHR as structured data. For Stage 2 there are two core objectives directly related to the use of electronic lab results by providers. One objective is the use of computerized provider order entry for medication, laboratory, and radiology orders directly entered by a licensed healthcare professional who can also enter orders into the medical record per state, local and professional guidelines. The other core objective for Stage 2 requires providers to incorporate clinical lab-test results into certified EHR technology as structured data.

The table below describes the specific meaningful use measures for Stage 1 and Stage 2.

Table: Meaningful Use Measures Related to Electronic Lab Results

	Measure	Objective	Requirement
Stage 1	Menu Set Measure 2 of 10 **Clinical Lab Test Results**	Incorporate clinical lab test results into EHR as structured data.	More than 40 percent of all clinical lab test results ordered by the EP during the EHR reporting period whose results are either in a positive/negative or numerical format are incorporated in certified EHR technology as structured data.
Stage 2	Core Measure 1 of 17 **CPOE for Medication, Laboratory, and Radiology Orders**	Use computerized provider order entry (CPOE) for medication, laboratory and radiology orders directly entered by any licensed healthcare professional who can enter orders into the medical record per state, local and professional guidelines.	More than 60 percent of medication, 30 percent of laboratory, and 30 percent of radiology orders created by the EP during the EHR reporting period are recorded using CPOE.
Stage 2	Core Measure 10 of 17 **Clinical Lab-Test Results**	Incorporate clinical lab-test results into Certified EHR Technology (CEHRT) as structured data.	More than 55 percent of all clinical lab tests results ordered by the EP during the EHR reporting period whose results are either in a positive/negative or numerical format are incorporated in Certified EHR Technology as structured data.

To evaluate whether providers are adopting the exchange of lab results electronically in their practice, CSHP conducted a mail survey of office-based physicians. Among other health IT topics and general physician and practice characteristics, the survey contained a section on electronic lab results. This section inquired about whether or not providers are able to view lab results electronically, what year this function was implemented in their practice, the percentage of lab results they view electronically and how they were able to view electronic lab results. A similar set of questions was asked about being able to send lab orders electronically. For providers that are not able to view lab results electronically or send lab orders electronically, respondents were asked whether they had plans to implement those functions in their practice in the near future and when they planned on implementing them. Also for those who are not able to view lab results or send lab orders, respondents were asked their main reason for not being able to

perform these functions. In addition, the survey measured whether the impact of viewing or sending lab results and orders electronically has a positive or negative effect on a key workflow and care management outcomes. Barriers to beginning or expanding the use of electronic orders and results delivery were also measured.

Part A: Clinical Laboratory Survey

Background

Clinical laboratories have an important role in enabling providers to make appropriate clinical decisions (ASCLS 2005). The availability of lab results in an EHR may contribute to efficiencies and assist with decision-making. The use criteria relevant to clinical laboratories relates to the ability of physicians to place electronic orders and incorporating lab results as structured data in the EHR.

A 2012 survey of hospital and independent clinical laboratories in New Jersey conducted by the NJ Health IT Coordinator's Office, in coordination with the New Jersey Department of Health, found that 49% of responding labs accept lab orders electronically (NJDHSS 2012). To meet the meaningful use measure related to acceptance of electronic lab orders, physicians must place more than 30% of their laboratory orders via computerized physician order entry (CPOE) (CMS 2012a). Sixty-five percent of respondents to the 2012 survey reported that lab results are sent electronically. Results from the survey indicated that the level of interoperability was low (NJDHSS 2012). Several strategies were identified to address the level of interoperability standards including participation in the Lab Interoperability Community of Practice (CoP) and encouraging the progress of non-electronic labs towards implementation (NJDHSS 2012). CMS does not require structured data to be exchanged electronically (CMS 2013). However, meaningful use measures require physicians to incorporate clinical lab results as structured data in the EHR (CMS 2012b, 2013). Twelve meaningful use clinical quality measures rely on laboratory testing (e.g., hemoglobin A1c control, LDL management and control, and colorectal cancer screening) (Henricks 2011). To meet the requirements for these measures, an interface with laboratory information systems and EHRs is realistically necessary (Henricks 2011).

To better understand the current capacity among the State's laboratories to receive and transmit health data in an electronic format, CSHP conducted a mail survey of New Jersey hospital and independent clinical laboratories. Hospital and clinical laboratories in New Jersey were surveyed about use of CPOE systems, capability, and standards used to send electronic lab results to providers, methods used to send reportable laboratory results to NJ DOH, methods used to send laboratory results to patients, health information exchange with NJ's six regional

HIOs, barriers to implementation or expansion of electronic capability, and future plans for implementation, if any.

Methods

The mail survey with telephone and web-based survey follow-up of non-responders was conducted from October 21, 2013, to February 12, 2014. The survey questionnaire was developed by CSHP research staff with input from the NJ Health IT Coordinator's Office. Survey topics included use of CPOE systems, capability, standards used to send electronic lab results to providers, methods used to send reportable laboratory results to NJ DOH, methods used to send laboratory results to patients, health information exchange with NJ's six regional HIOs, barriers to implementation or expansion of electronic capability, and future plans for implementation, if any. A list of Clinical Laboratory Improvement Amendments (CLIA) registered clinical laboratories was obtained from the CLIA database (CDC 2013). The survey questionnaire along with a cover letter on State letterhead signed by the NJ Health IT Coordinator explaining the nature of the survey was mailed to the state's 93 hospital and 101 independent laboratories. The respondents had 3 weeks to respond to the survey. A second mailing was sent to non-responders with an additional 3 weeks to respond to the survey. Follow-up telephone calls were then made to non-responders to encourage their participation in the survey. They were given the opportunity to complete the survey on the telephone or through a web-based survey.

Table 2.1 contains the number of interviews completed from each list. The overall response rate for the survey (after excluding labs that were closed, disconnected or not a lab) was 41.8%.

Table 2.1: Status of Clinical Laboratory Response

Status	
Completed	76
Still Waiting	104
Refused	3
Closed	2
Disconnected	2
Not a Lab	5
No Patients	1
TOTAL	194

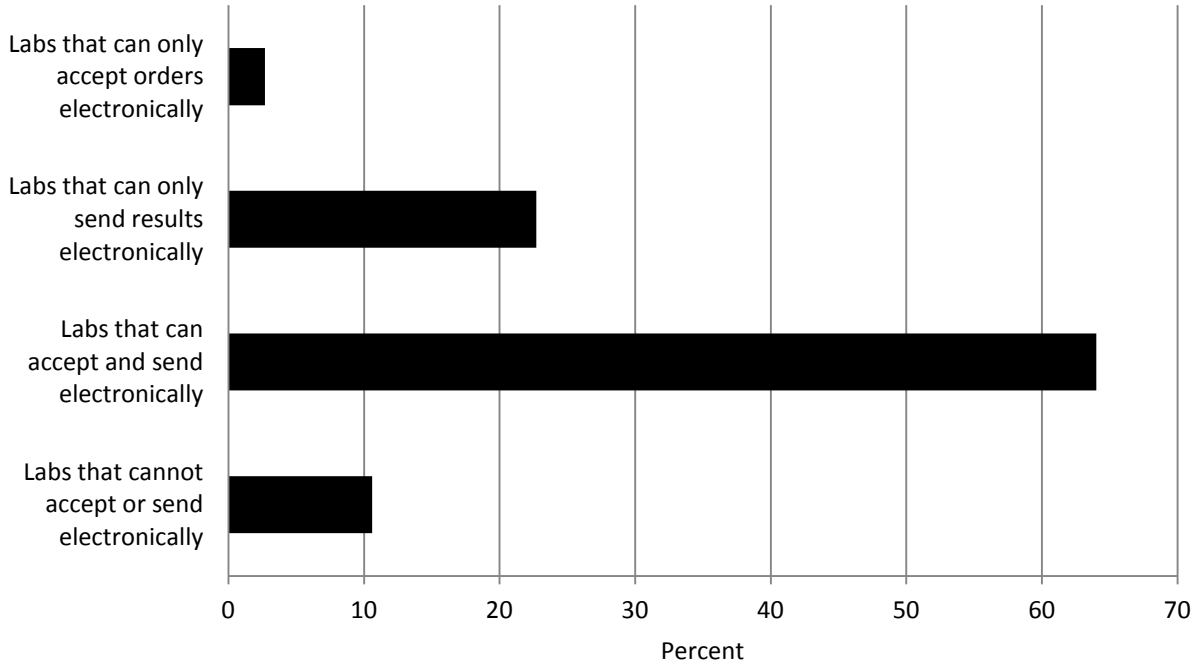
This report contains frequencies of all survey items. It also includes cross-tabulations by laboratories that do or do not accept lab orders electronically and laboratories that do or do not send results electronically to an ordering health care provider.

Findings

Section A: Methods Used to Receive Laboratory Orders

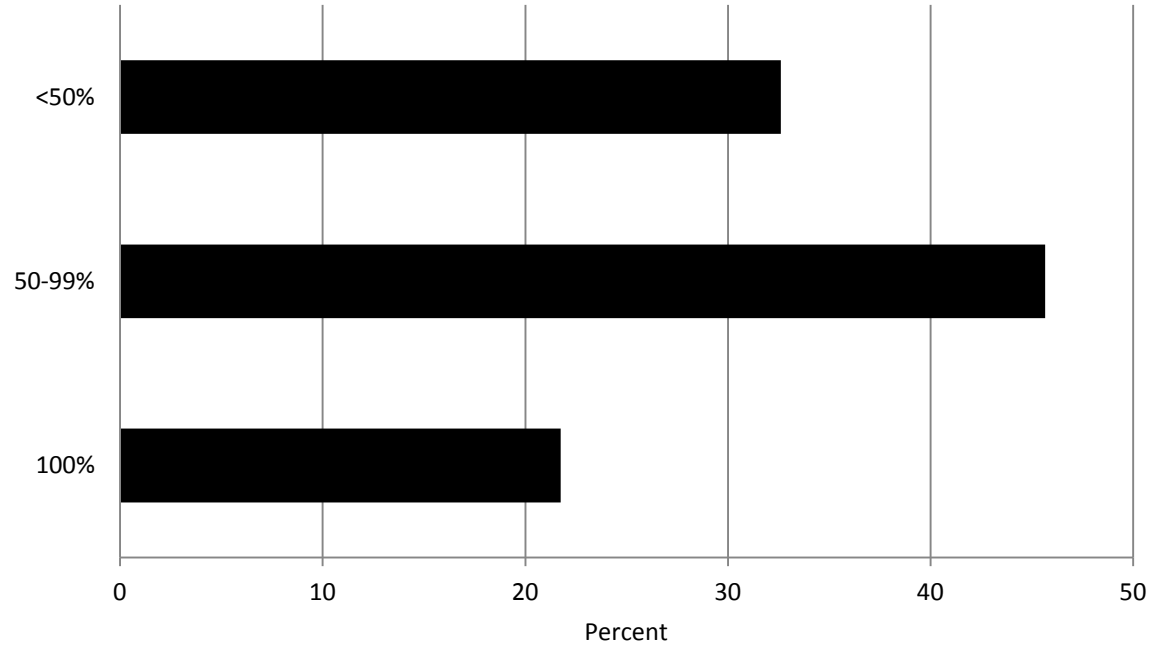
Table 2.2 and Figures 2.1-2.8 include the item frequencies for methods used to receive laboratory orders. About two-thirds (67.1%) of labs reported that providers are able to order lab tests electronically (see Figure 2.1, the sum of the first and third bar). Among laboratories that accept electronic orders from an EHR or CPOE system, about two-thirds (67.4%) of laboratories reported that more than 50% of providers submit via electronic message (see Figure 2.2). The most common method for accepting clinical laboratory orders (see Figure 2.3) was through the office EHR system (68.6%) followed by external web portal (29.4%). Other methods used to accept laboratory orders include an interface to the hospital information system, third party middleware, internal interface, and in-house software. The electronic standard used for accepting lab orders (see Figure 2.4) was most frequently HLV v2.3.1 (47.1%) followed by HLV v2.5.1 (23.5%), LOINC (21.6%), SNOMED-CT (11.8%), and HL7 v3 (7.8%).

Figure 2.1: Laboratories that Accept/Send Electronic Lab Orders/Results Delivery



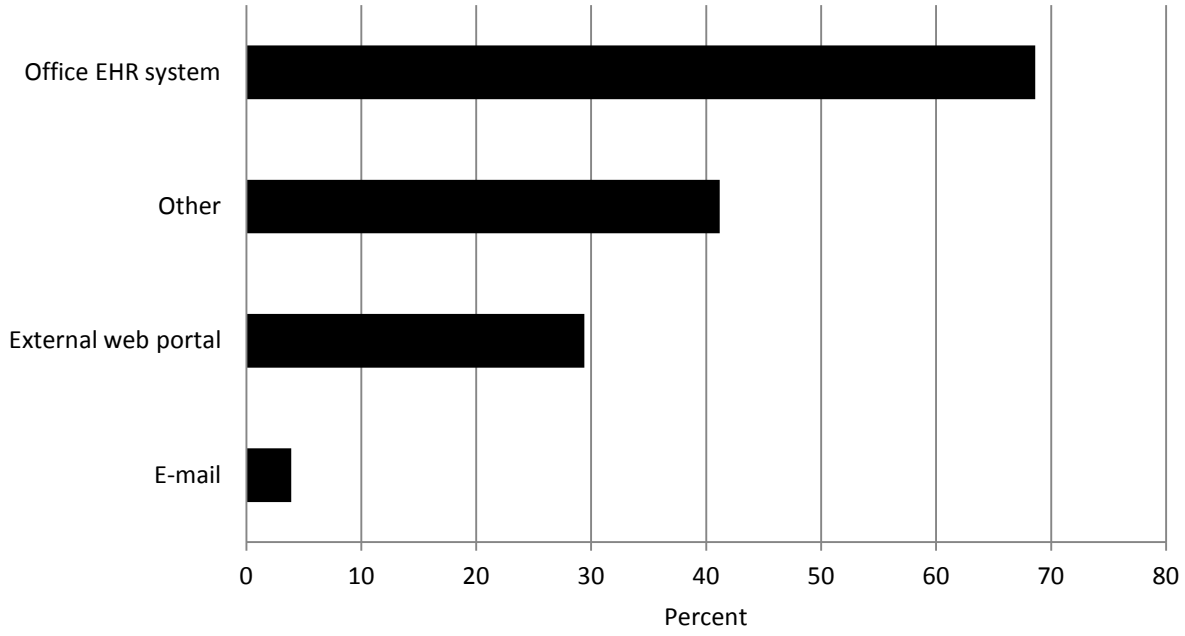
Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.2: Providers Submitting Lab Orders via Electronic Messages among Labs that Accept Electronic Lab Orders



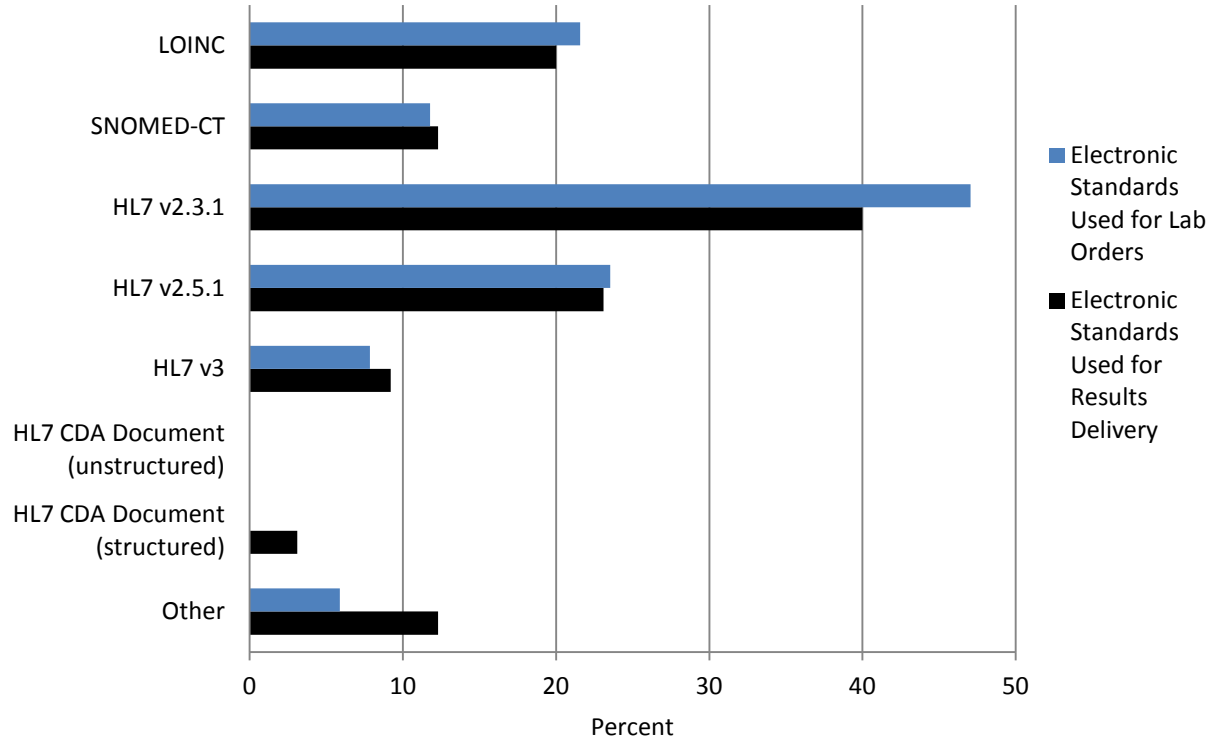
Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.3: Method Used by Clinical Laboratory to Accept Electronic Lab Orders among Labs that Accept Electronic Lab Orders



Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.4: Electronic Standards Used by Labs for Lab Orders/Results Delivery

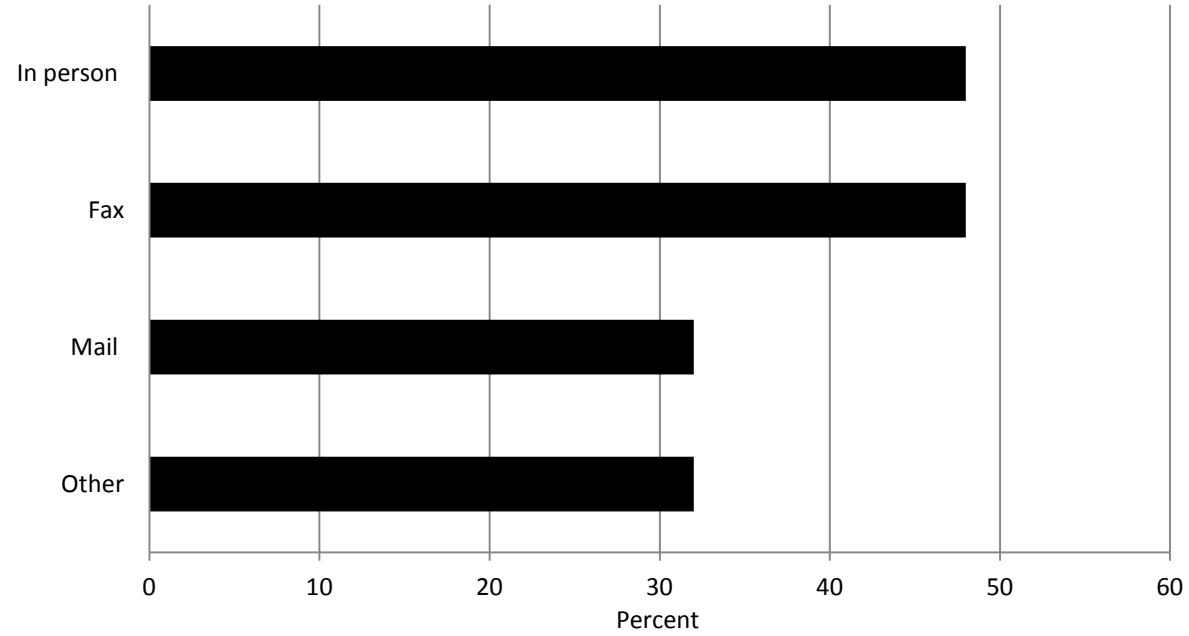


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Barriers to Accepting Electronic Lab Orders

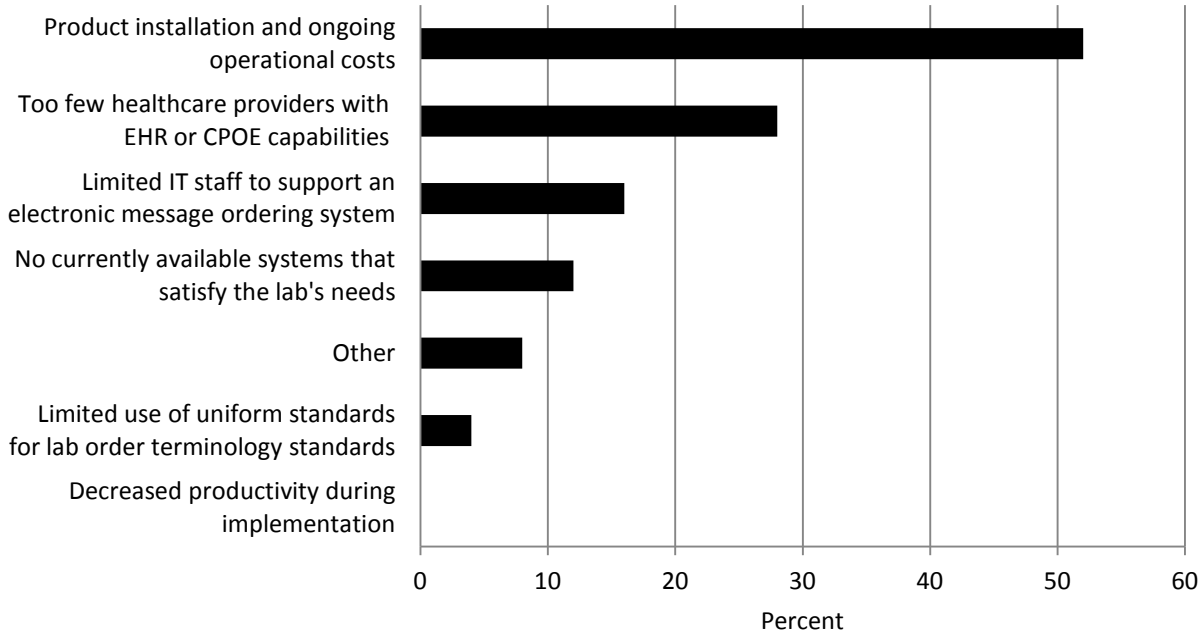
Among laboratories that do not accept electronic orders (32.9%), the most common methods for accepting orders from providers (see Figure 2.5) were in-person (48.0%) and fax (48.0%). About one-third (32.0%) accept laboratory orders by mail and about one-third (32.0%) specified other methods for accepting laboratory orders, including courier and paper requisitions forms. The most common major barrier to adopting electronic lab order messages (see Figure 2.6) for these labs was product installation and operational costs (52.0%) and too few healthcare providers with EHR or CPOE capabilities (28.0%). Twelve percent of respondents reported plans to implement electronic lab ordering within the next 6 months, 20% within the next year, 20% within in the next two years or more, and 48% have no plans to implement electronic lab ordering (see Figure 2.7).

Figure 2.5: Method Used to Accept Lab Orders from Healthcare Providers among Labs that Do NOT Accept Electronic Lab Orders



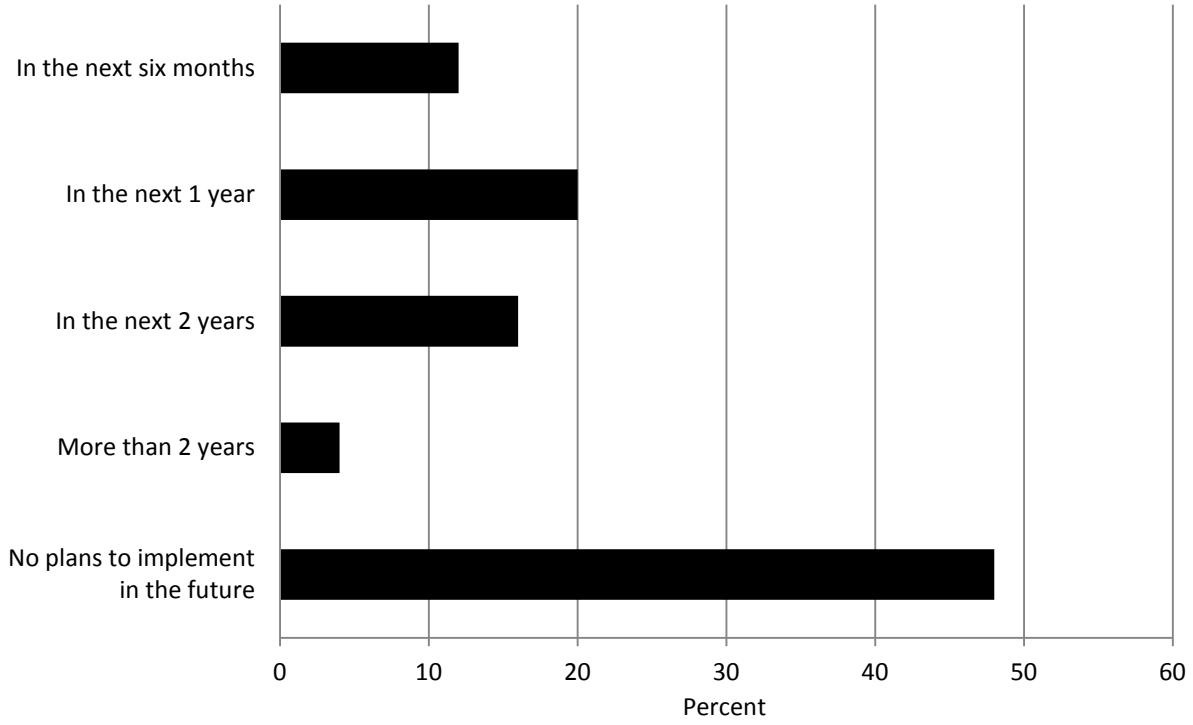
Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.6: Major Barriers to Adopting Electronic Lab Order Messages among Labs that Do NOT Accept Electronic Lab Orders



Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.7: Plans to Implement Electronic Lab Orders among Labs that Do NOT Accept Electronic Lab Orders

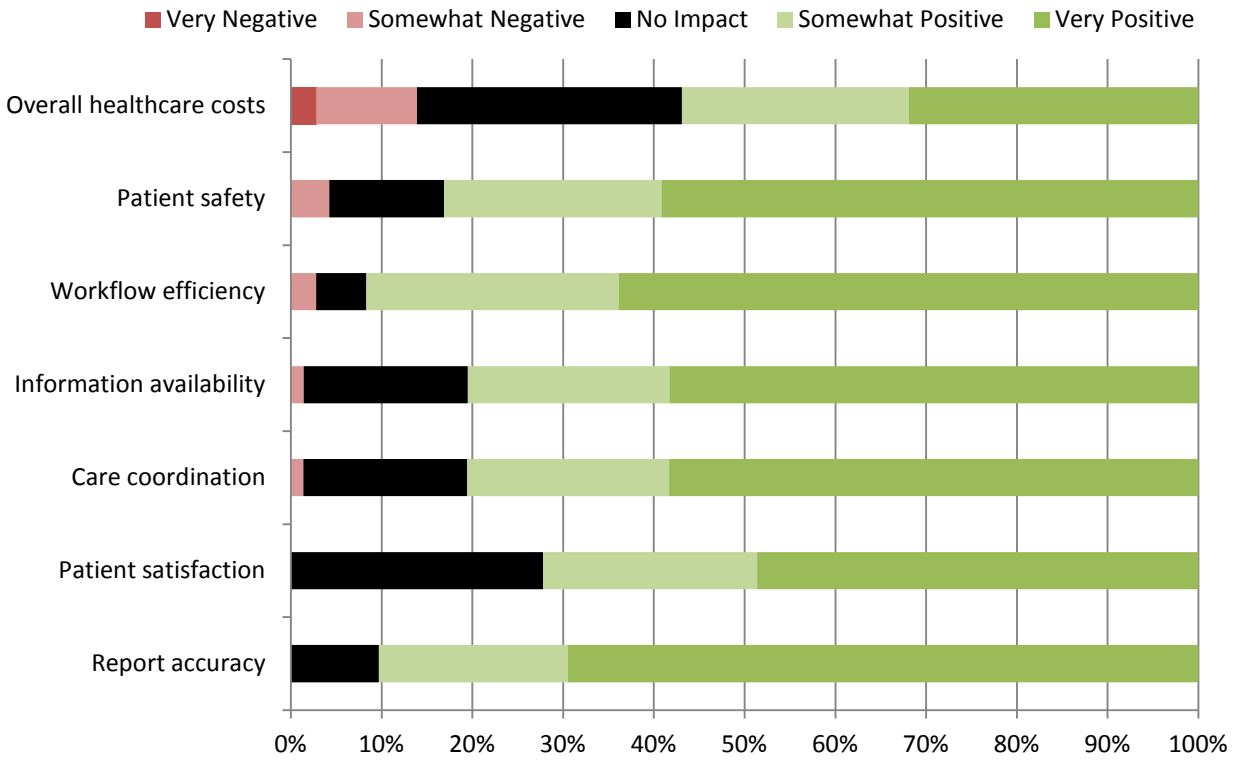


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Perceptions about the Impact of Electronic Lab Order Entry

More than 80% of labs indicated that there would be a positive impact of electronic lab order entry (see Figure 2.8) on workflow efficiency (somewhat/very positive=91.7%), report accuracy (somewhat/very positive=90.3%), patient safety (somewhat/very positive=83.1%), care coordination (somewhat/very positive=80.6%), and information availability (somewhat/very positive=80.6%). Labs were slightly less positive overall for the impact on patient satisfaction, with just over 70% of labs indicating a positive impact (somewhat/very positive=72.2%; no impact=27.8%). For overall healthcare costs, over half of labs believed that the impact would be positive (somewhat/very positive=56.9%; no effect=29.2%; very/somewhat negative=13.9%).

Figure 2.8: Labs' Perceptions of the Impact of Accepting Electronic Lab Orders from Physicians

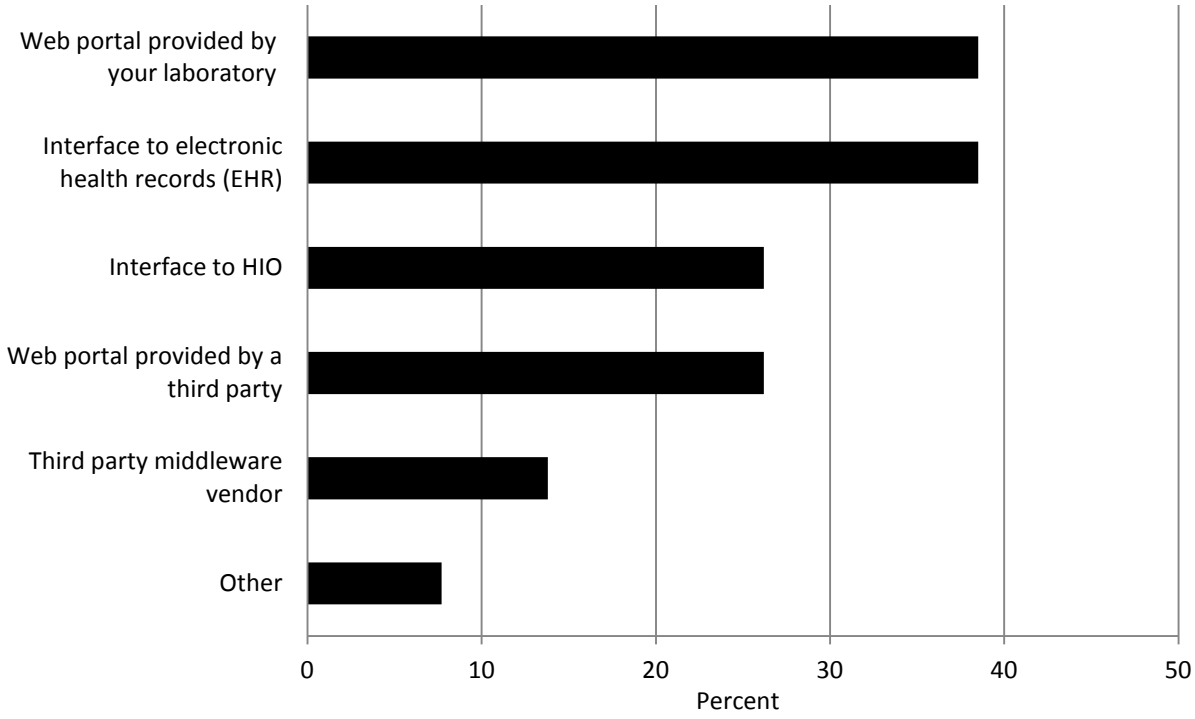


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Section B: Methods Used to Send Laboratory Results to Health Care Providers

Table 2.3 and Figures 2.1 and 2.9 include the item frequencies for methods used to send laboratory results to providers. The majority (86.7%) of labs are capable of sending test results electronically in a structured format (see Figure 2.1, the sum of the second and third bar). Among laboratories that are capable of sending test results electronically, the method most frequently used (see Figure 2.9) was an interface to EHR (67.7%), followed by web portal provided by the laboratory (38.5%), interface to health information organization (38.5%), and web portal provided by a third party (26.2%). The electronic standard used for reporting lab results was most frequently HL7 v2.3.1 (40.0%) followed by HL7 v2.5.1 (23.1%), LOINC (20.0%), SNOMED-CT (12.3%), and HL7 v3 (9.2%).

Figure 2.9: Method Used by Laboratory to Share Test Results Electronically among Labs that Send Electronic Test Results

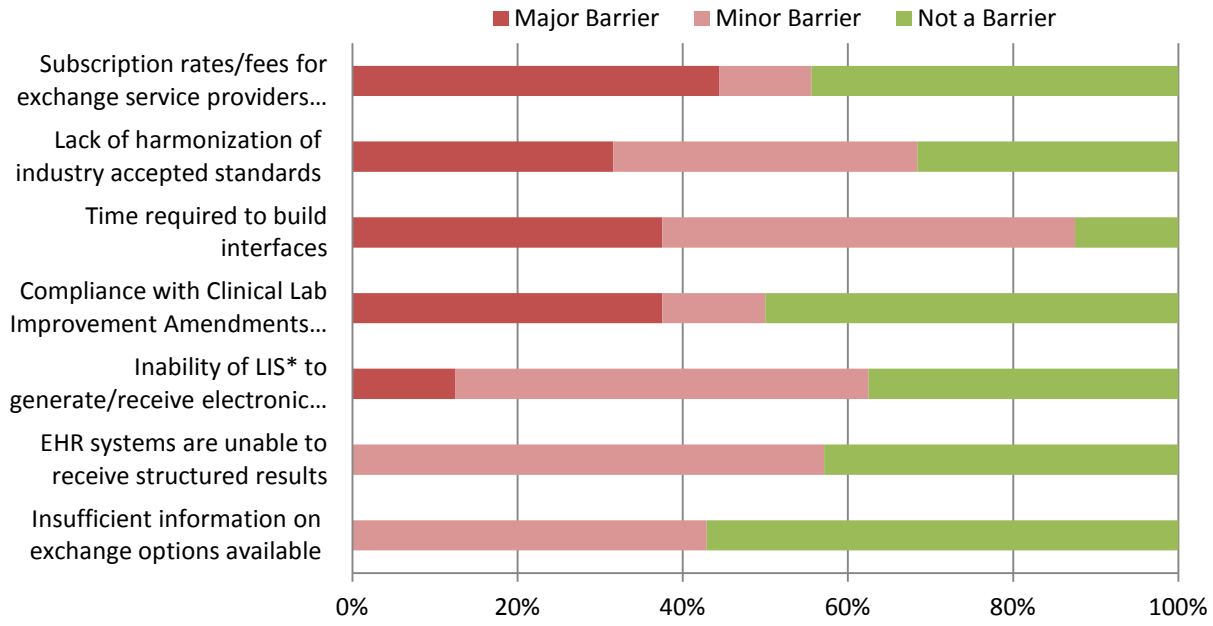


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Barriers to Implementing Electronic Delivery of Laboratory Results

Among laboratories that are not capable of sending test results electronically (13.3%), the major barriers to implementing electronic delivery of laboratory results (see Figure 2.10) were subscription rates for exchange service providers (44.4%), lack of harmonization of industry accepted standards (42.9%), compliance with CLIA regulations (37.5%) and time required to build interfaces (37.5%). The most frequently reported minor barrier was EHR systems unable to receive structured results (57.1%) followed by time to build interfaces (50.0%). Eighty percent of labs that were not capable of sending test results electronically plan to do so in the future (see Figure 2.11).

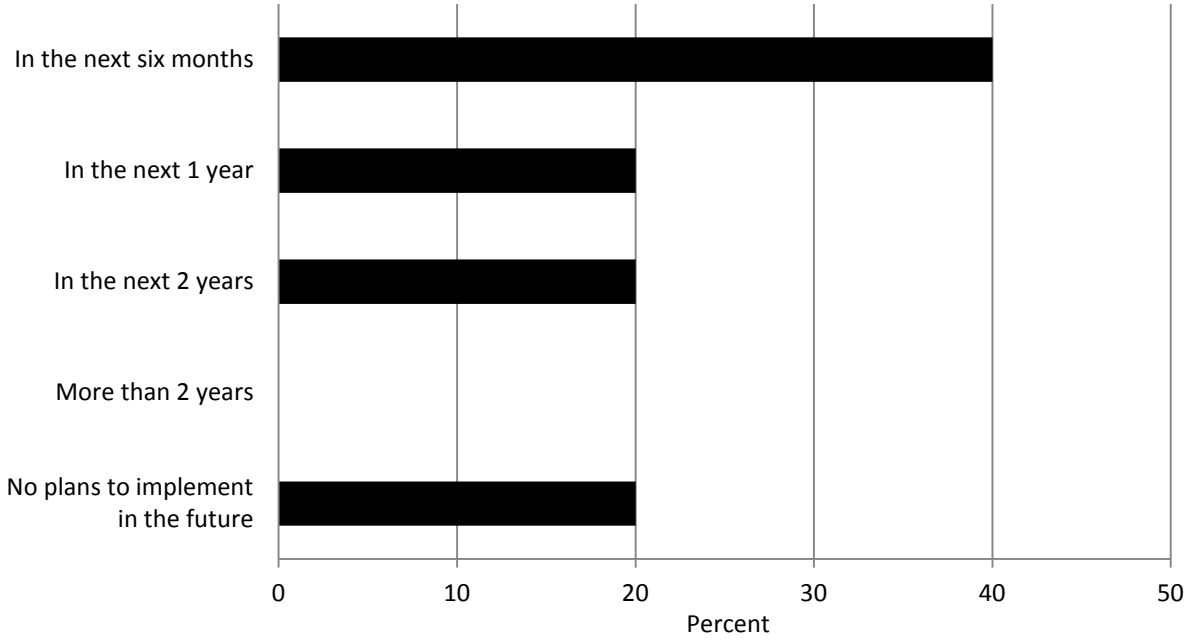
Figure 2.10: Barriers to Electronic Delivery of Laboratory Test Results among Labs that Do NOT Send Test Results Electronically



*Laboratory Information System

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.11: Plans to Implement Electronic Reporting of Results among Labs that Do NOT Send Test Results Electronically

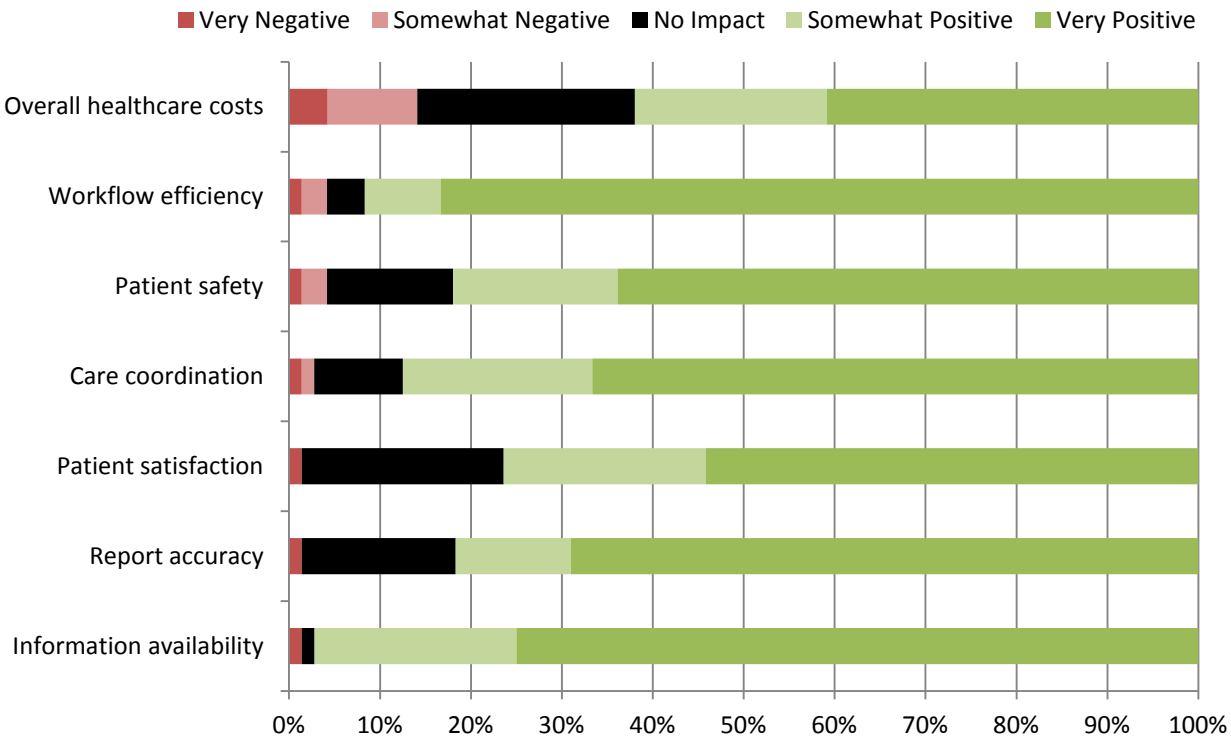


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Perceptions about the Impact of Electronic Delivery of Lab Results

More than 80% of labs indicated that there would be a positive impact of electronic lab order entry (see Figure 2.12) on information availability (somewhat/very positive=97.2%), workflow efficiency (somewhat/very positive=91.7%), care coordination (somewhat/very positive=87.5%), patient safety (somewhat/very positive=81.9%), and report accuracy (somewhat/very positive=81.7%). Labs were slightly less positive overall for the impact on patient satisfaction, with just over three-quarters of labs indicating a positive impact (somewhat/very positive=76.4%; no impact=22.2%; very/somewhat negative=1.4%). For overall healthcare costs, over half of labs believed that the impact would be positive (somewhat/very positive=62.0%; no effect=23.9%; very/somewhat negative=14.1%).

Figure 2.12: Labs' Perceptions about the Impact of Sending Electronic Lab Results to Physicians

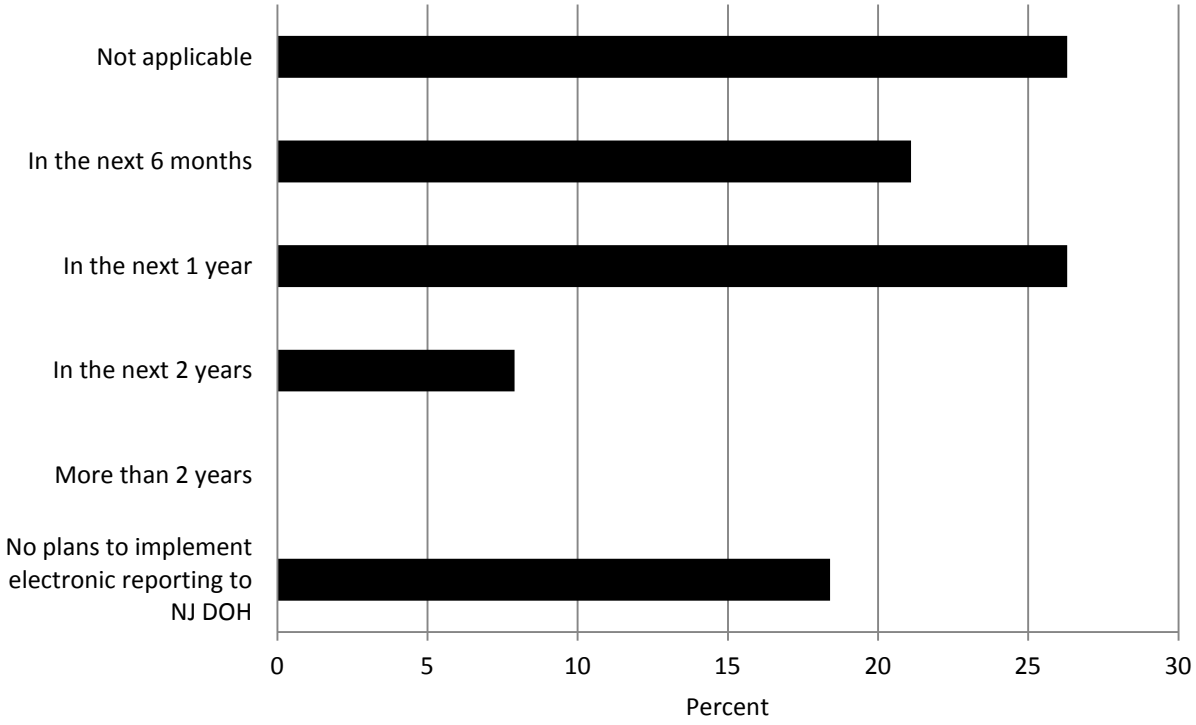


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Section C: Methods Used to Send Laboratory Results to NJ Department of Health

Table 2.4 includes item frequencies for methods used to send laboratory results to NJ DOH. Forty percent of labs send test results to NJ DOH. Among laboratories that send test results electronically to NJ DOH, the labs are capable of using the following standards: LOINC (39.3%), SNOMED-CT (35.7%), HL7 v2.3.1 (35.7%), HL7 v2.5.1 (28.6%), and data entry into DOH Registry (21.4%). Among the 55.3% of labs that do not send test results electronically to NJ DOH, 21.1% plan to implement electronic reporting in the next 6 months and 34.2% plan to implement electronic reporting in the next 1-2 years (see Figure 2.13).

Figure 2.13: Plans to Implement Electronic Reporting to NJ Department of Health among Labs that Do NOT Send Test Results Electronically to NJ DOH

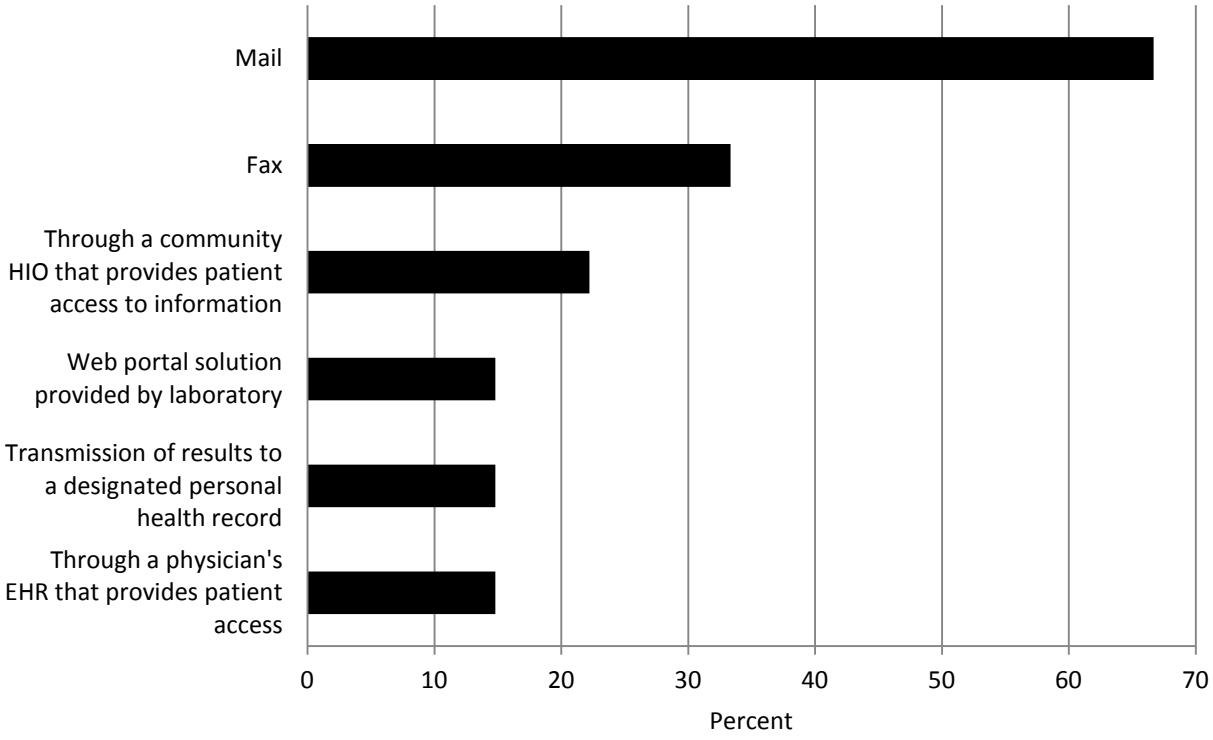


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Section D: Methods Used to Send Laboratory Results to Patients

Table 2.5 includes item frequencies for methods used to send laboratory results to patients (see Figure 2.14). Over a third (37.5%) of labs allow patients direct access to results; the method used most frequently was mail (66.7%) followed by fax (33.3%) (see Figure 2.14).

Figure 2.14: Methods Used to Deliver Results Directly to Patients or Patients' Legal Representatives

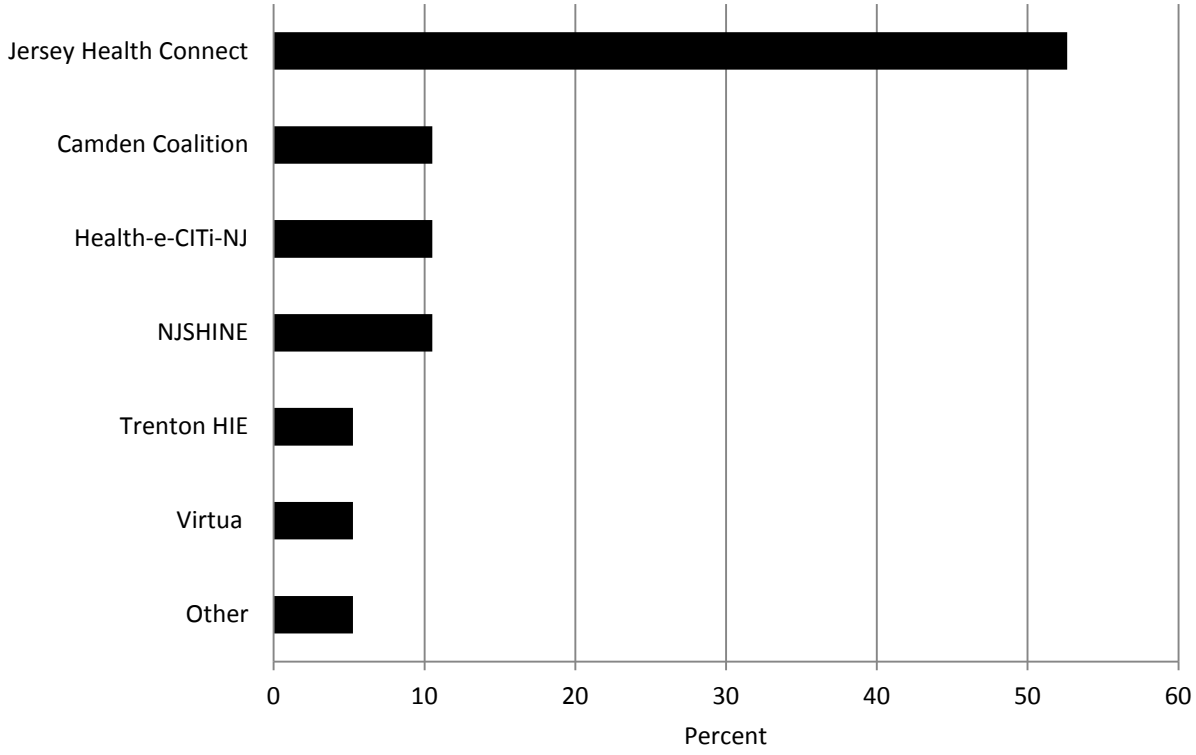


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Section E: Health Information Exchange with Health Information Organizations

Table 2.6 includes item frequencies for health information exchange with HIOs. About one-quarter (26.8%) of labs are sharing structured lab data electronically with any NJ HIO. Among labs that share data with any HIO, Jersey Health Connect was reported most frequently (52.6%) (see Figure 2.15).

Figure 2.15: Labs Participation with HIOs (N=19)

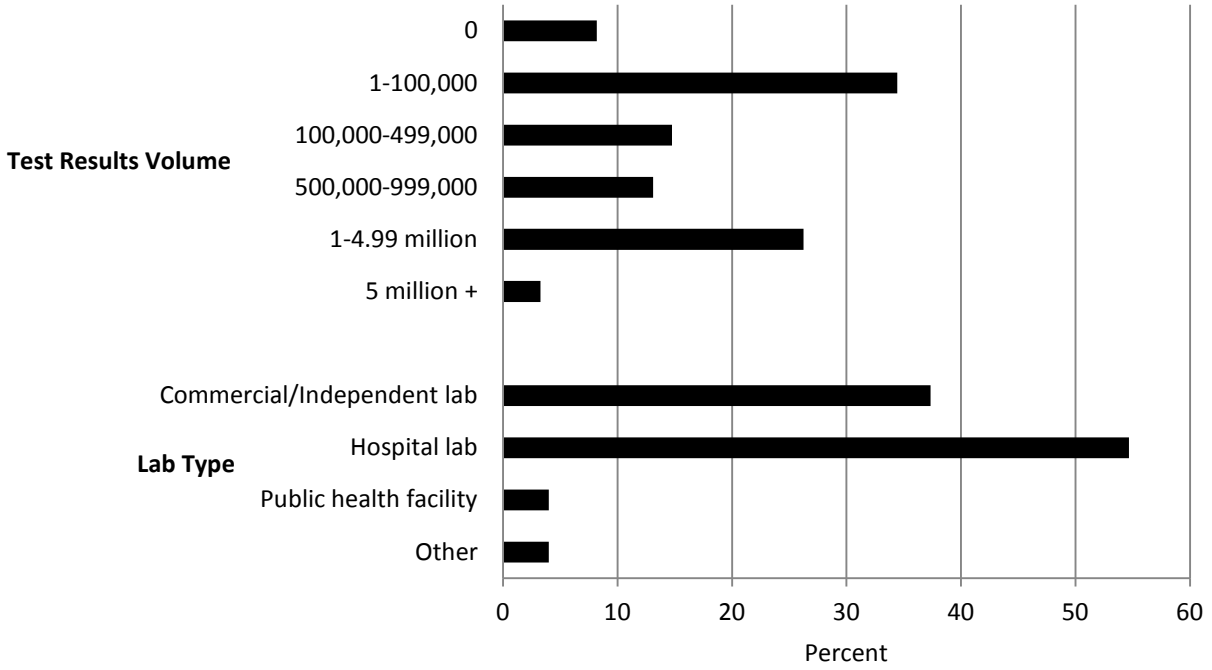


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Section F: General Information

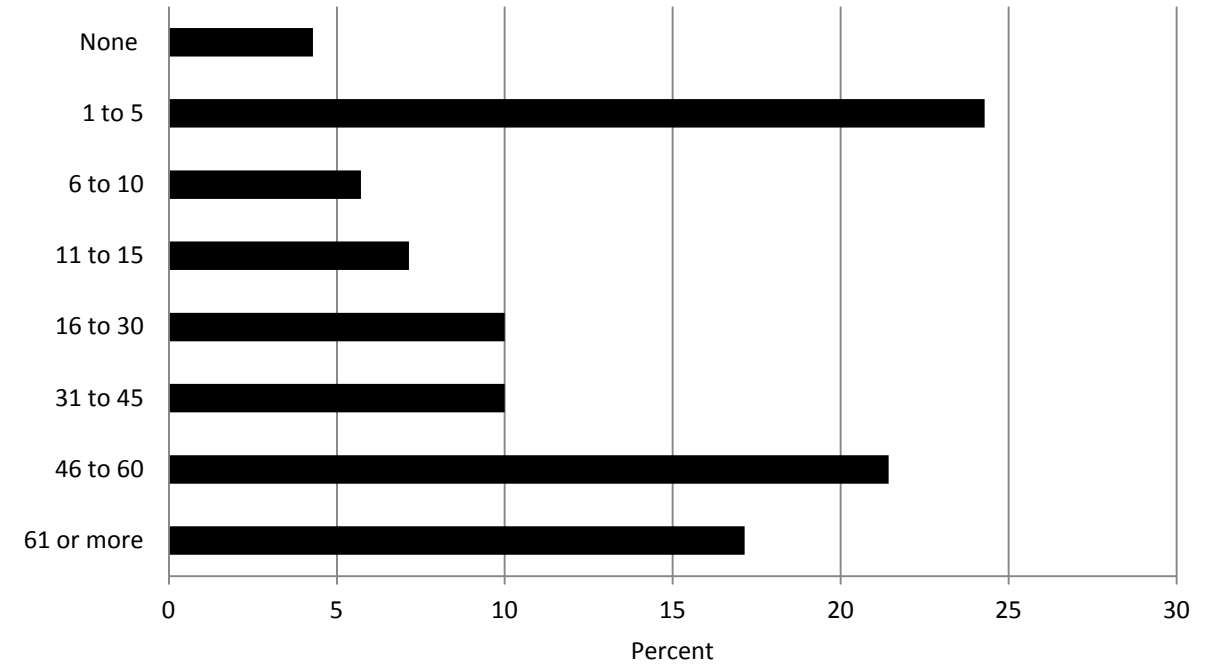
Table 2.7 and Figures 2.16 and 2.17 include item frequencies for general information about the characteristics of the labs. Slightly more than half (54.7%) were hospital labs and 37.3% were commercial/independent labs. The number of full-time equivalents that worked only in the laboratory ranged from none to greater than 200. The volume of test results sent in 2012 ranged from none to more than 5 million. About one-third (34.4%) of labs had annual test volume of 1-100,000, just over one quarter (27.9%) had a volume 100,000-999,000, and slightly less than one third (29.5%) had a test volume of 1 million or greater. Over half of respondents were laboratory director or managers (laboratory director=24.7%; laboratory manager=31.5%). Other respondents included laboratory information systems directors, laboratory systems administrators, and IT directors.

Figure 2.16: Laboratory Characteristics: Volume of Test Results, Type of Laboratory Facility



Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Figure 2.17: Full Time Equivalent Staff in the Laboratory

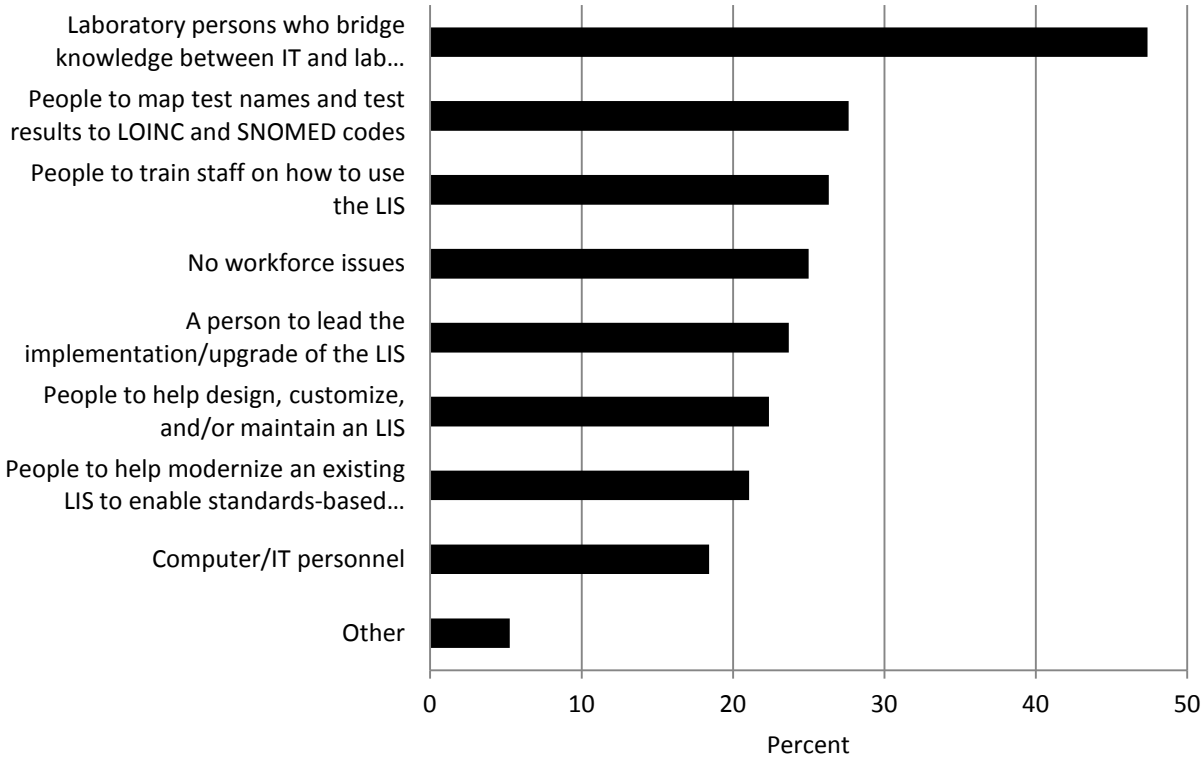


Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Greatest Need within the Lab

The LIS technology-related skills in greatest need (see Figure 2.18) are laboratory persons who bridge knowledge between IT and lab (47.4%), people to help map test names and test results to LOINC and SNOMED codes (27.6%), and people to train staff on how to use the LIS (26.3%). One-quarter of labs reported no workforce issues.

Figure 2.18: LIS Technology-Related Skills and/or Roles in Greatest Needs



Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Conclusions

The most common barriers to accepting electronic lab orders were financial burden (installation and operating costs) and a limited number of healthcare providers with the capability to place electronic lab orders. Among the 32.9% of labs that lack the capability to accept electronic lab orders, over half have an implementation plan. The major barriers to implementing electronic reporting of laboratory results were financial burden (subscription rates for exchange service providers) and lack of harmonization of industry accepted standards. Among the 13.3% of labs that were not capable of sending test results electronically, 80% have an implementation plan. Overall, the perceived impact of electronic lab order and electronic delivery of laboratory

results was positive. The technology related skill in greatest need was laboratory persons who bridge knowledge between IT and lab.

Part B: Physician Survey

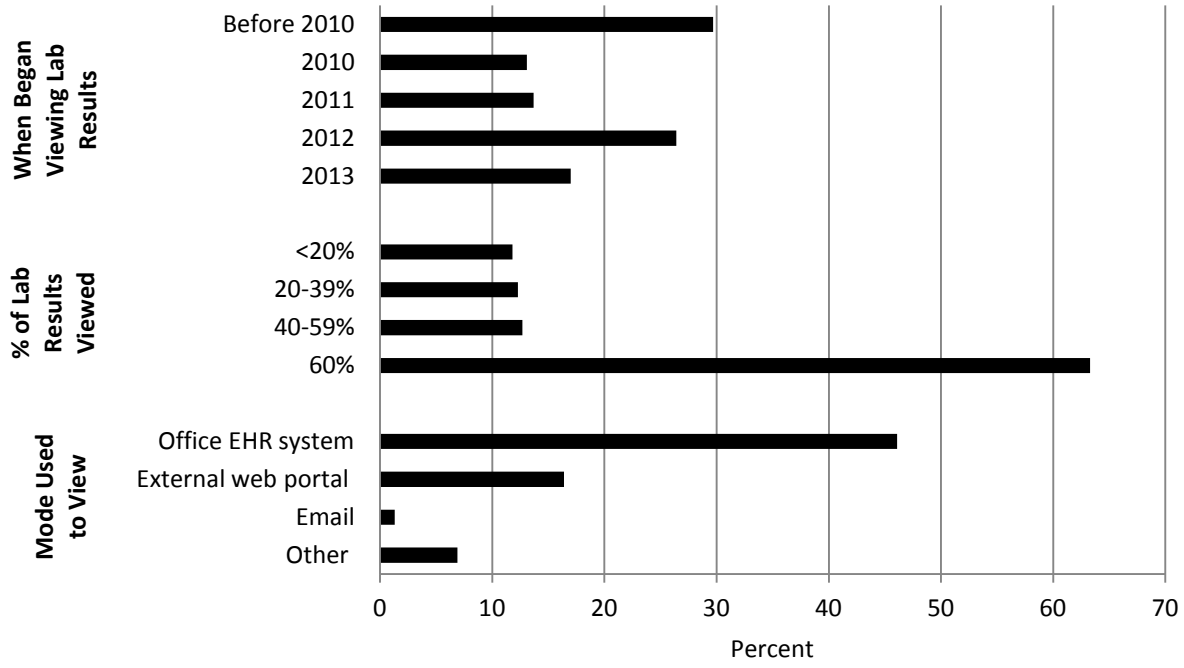
Methods

The physician survey is described above under Chapter 1. Topics of interest such as use of electronic lab requests/results, plans for implementation, and benefits of and barriers to the implementation and use of electronic lab requests/results were analyzed by key physician and practice characteristics (physician age, practice size, and primary specialty groups). Frequencies of all measures and cross-tabulations of all measures by age, medical practice size, and primary specialty groups are presented. Most survey questions had item non-response below 5%. For these variables, missing values are excluded from the analysis.

Findings

Table 2.8 and Figures 2.19-2.23 contain the weighted frequencies for the physician survey items related to the use of electronic lab test orders and results delivery.

Figure 2.19: Physicians that DO View Lab Results Electronically from Main Practice Location



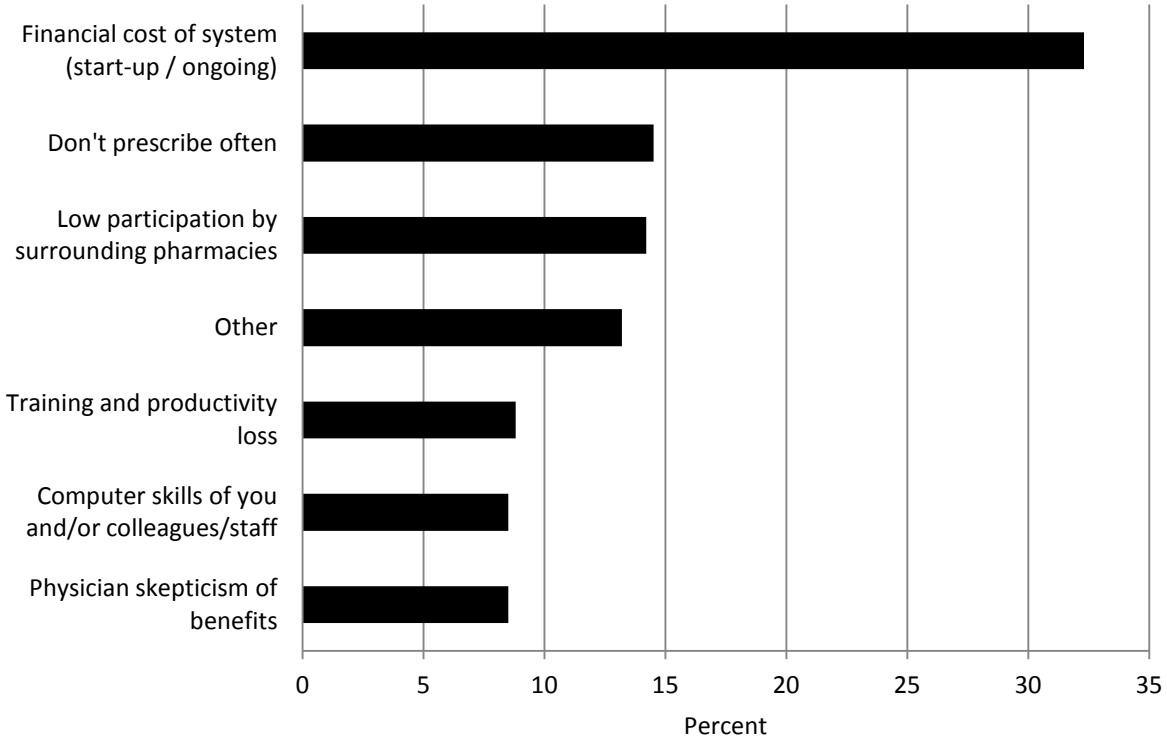
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Frequencies-Physician Use of Electronic Lab Test Results Delivery

Nearly two-thirds (62.6%) of NJ's physicians are currently viewing test results from clinical labs electronically (see Figure 2.19). Among those able to view lab test results electronically, 29.7% began viewing results electronically before 2010, and over a quarter (26.4%) more added this capability in 2012. Nearly two-thirds (63.3%) of those with electronic results delivery capacity view at least 60% of their lab results electronically. Almost half (46.1%) use an office EHR system and 16.4% use an external web portal for viewing results electronically.

Among those not viewing lab test results electronically (37.4%), about a quarter plan to gain this capacity in 2014; however, 60.7% have no plans to view lab results electronically in the future. Financial costs are cited by about a third (32.3%) as the main reason for not viewing lab results electronically (see Figure 2.20); other reasons include that their specialty does not use labs often (14.5%) and low participation by surrounding labs (14.2%).

Figure 2.20: Physicians - Main Reason for Not Viewing Lab Results Electronically

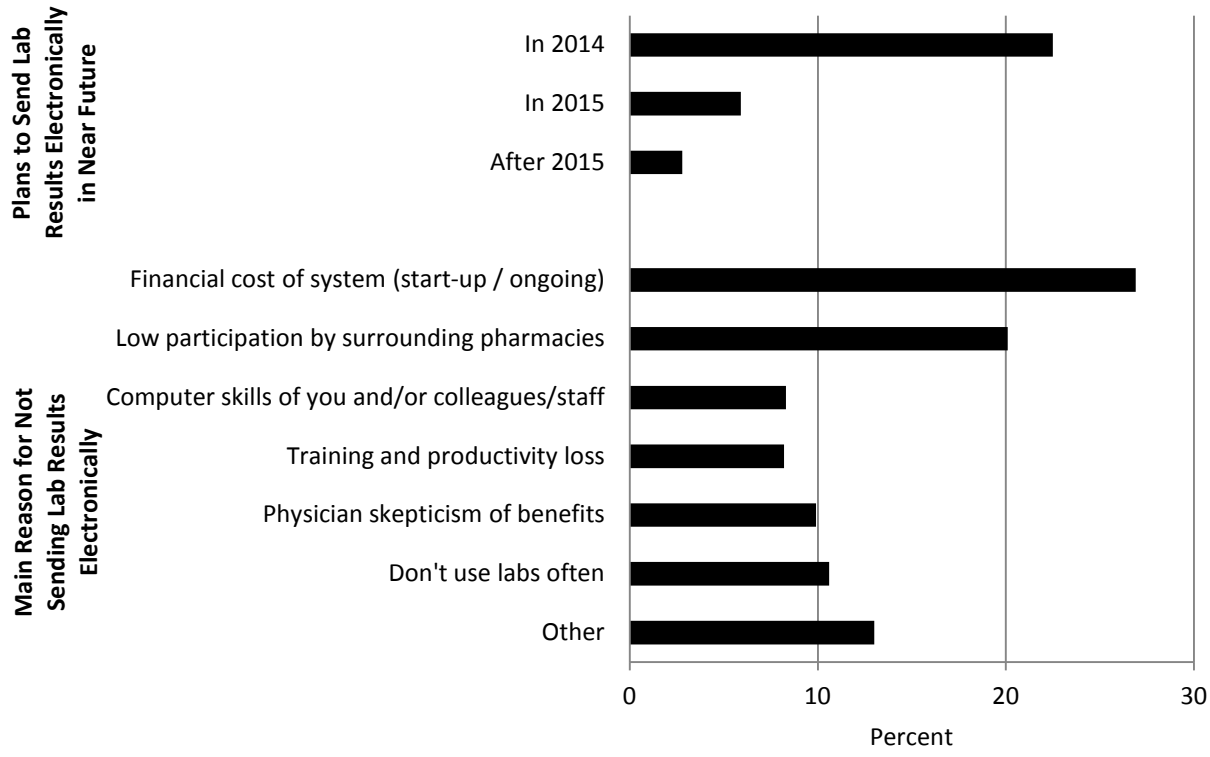


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Fewer (37.1%) physicians send lab test requests electronically (see Figure 2.21). Among those able to send lab test requests electronically, about one-fourth (26.9%) began sending requests electronically before 2010 and another one-fourth (24.2%) added this capability in 2012. Nearly two-thirds (65.5%) send at least 60% of their lab requests electronically. The majority (73.2%) used an office EHR system for lab requests, with most of the others (18.7%) using an external web portal.

Among those not sending lab requests electronically (61.5%), about two-thirds (63.7%) have no plans to gain this capacity in the future, although 22.5% plan to gain this capacity in 2014. Financial costs are again cited most often (26.9%) as the main reason for not sending lab requests electronically, followed by low participation by surrounding labs (20.1%).

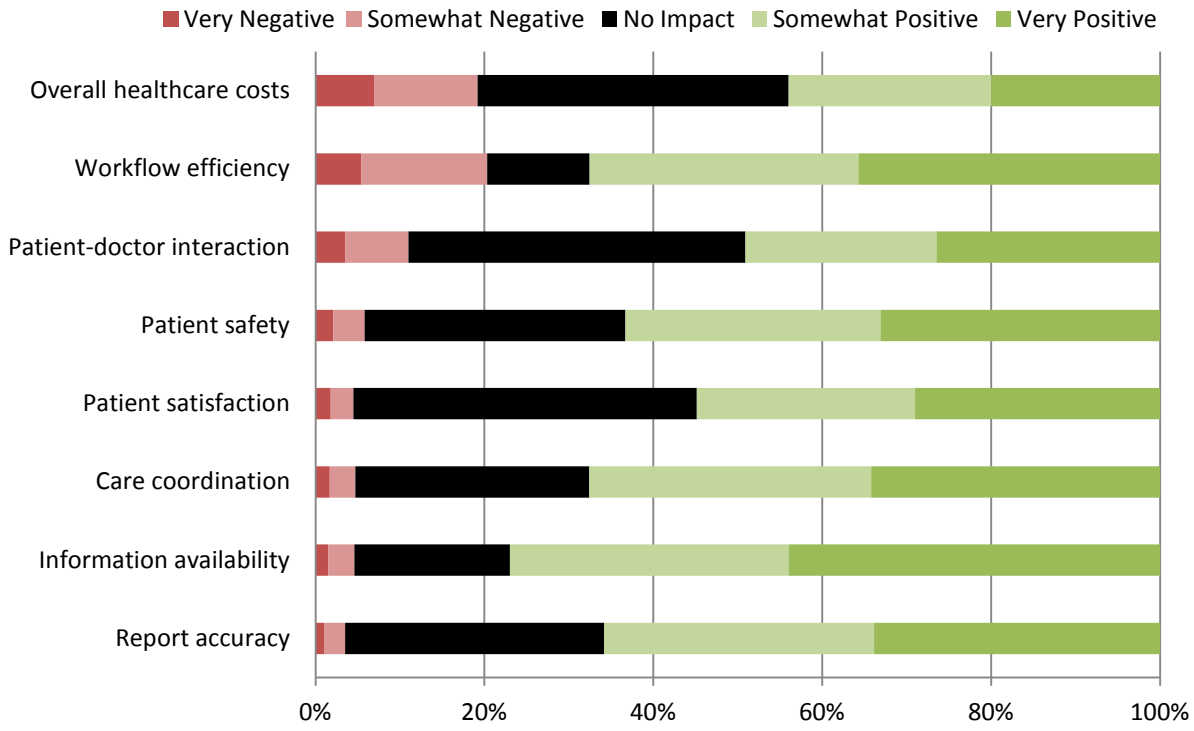
Figure 2.21: Physicians that Do NOT Send Lab Results Electronically from Main Practice Location



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For the items used to assess the impact of electronic lab orders/results delivery on their practice (see Figure 2.22), across most measures, a large majority of physicians felt that it would have a very or somewhat positive impact. This was especially true for care coordination (77.6%) and information availability (77.0%). The exceptions were impact on overall healthcare costs and patient-doctor interaction where less than half (44.0% and 49.1%, respectively) thought it would have a positive impact.

Figure 2.22: Physicians - Impact of Electronic Lab Results/Order Entry
(whether currently using or not)

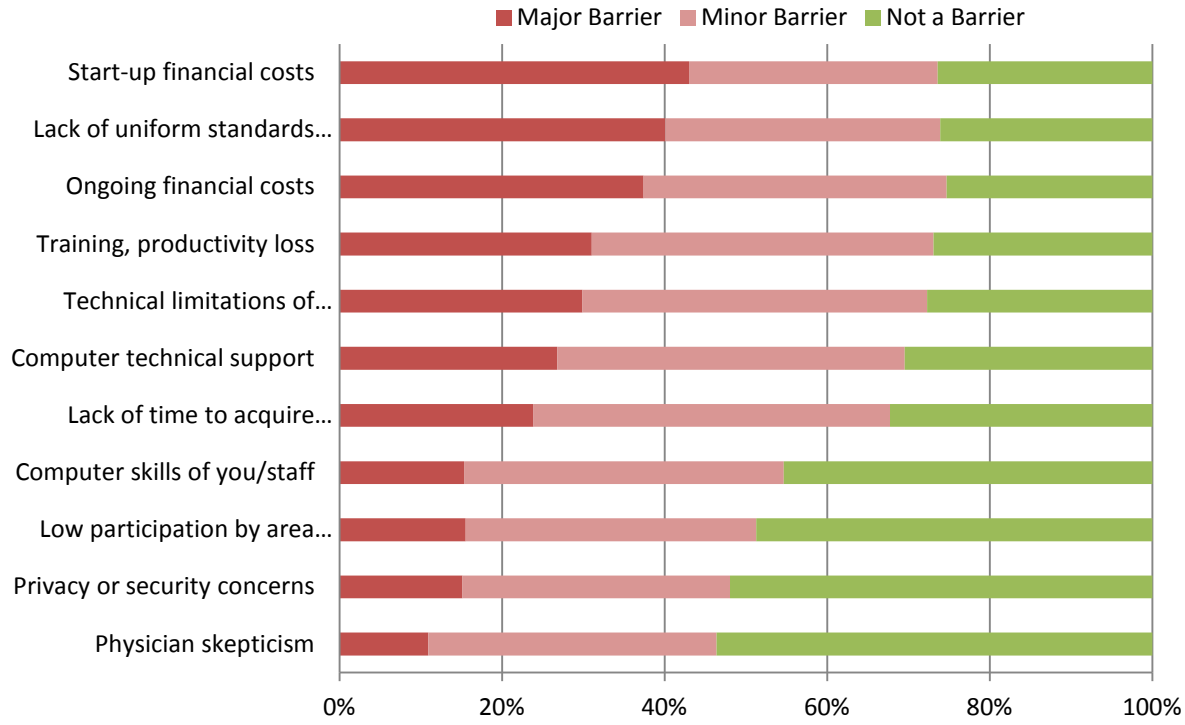


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For implementing or expanding the use of electronic lab requests/results delivery, start-up financial costs was the top barrier cited (see Figure 2.23), with 43.0% of physicians saying it was a major barrier and another 30.6% saying it was a minor barrier. This was closely followed by ongoing financial costs, lack of uniform standards within the industry (multiple systems), training and productivity loss, and technical limitations of the systems. Physician skepticism, privacy or security concerns, computer skills of physician/staff, and low participation by area labs were rarely cited as major barriers.

Practice and physician characteristics of the respondents can be found in Chapter 1.

Figure 2.23: Physicians - Barriers to Implementing or Expanding the Use of Electronic Lab Results/Order Entry *(whether currently using or not)*

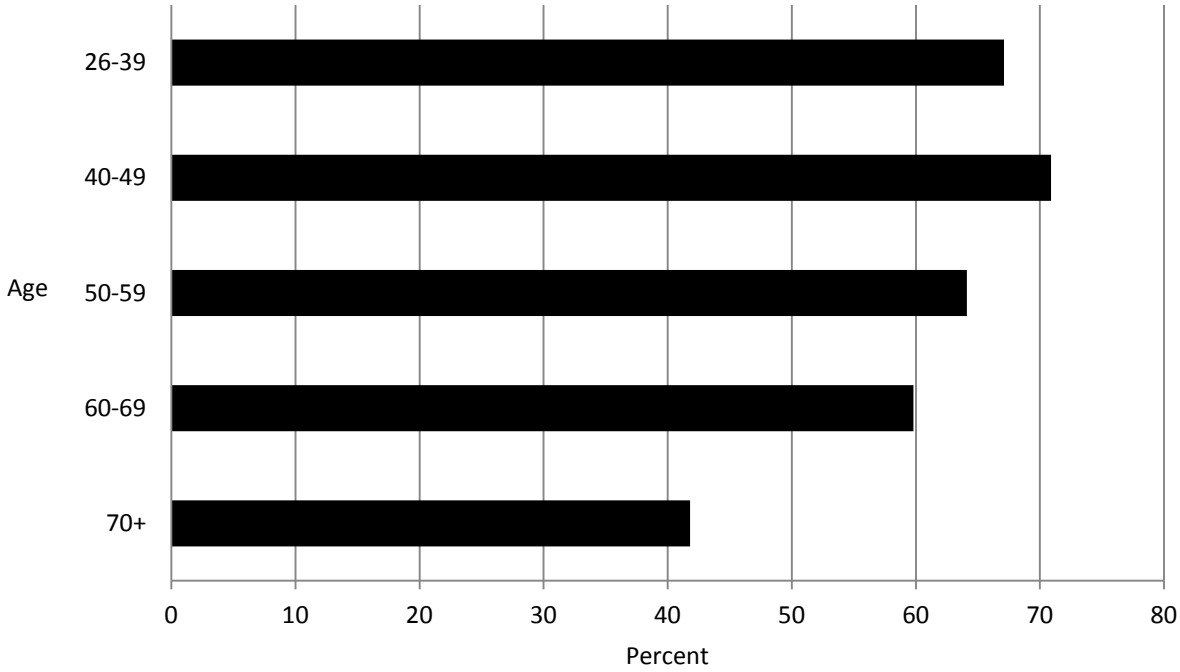


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Crosstabs-Physician Use of Electronic Lab Test Results Delivery

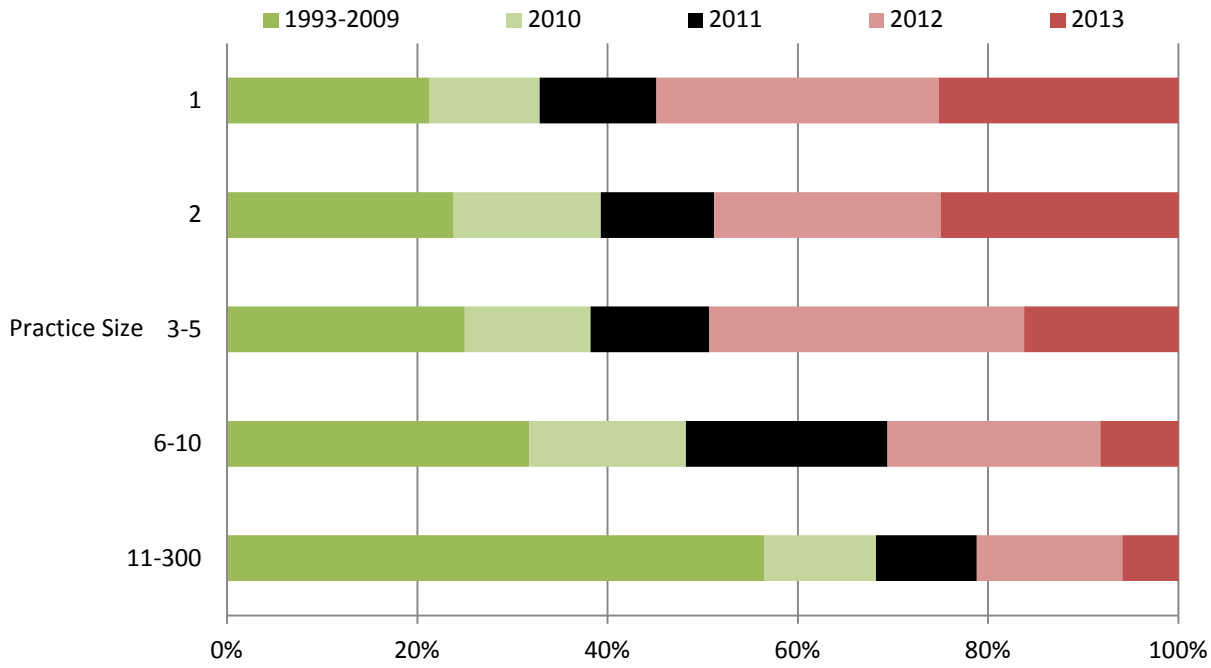
For viewing lab results electronically, physicians ages 60 and over (see Figure 2.24), solo physicians, and specialists were significantly less likely to view test results from clinical labs electronically. Older physicians (see Figure 2.26) were less likely to view 60% or more of their lab results electronically, whereas physicians in larger practices (see Figure 2.27) and Primary care physicians (see Figure 2.28) were more likely to do so. Physicians ages 70 or more were less likely to use an office EHR system and more likely to use an email to view lab results. Specialists were more likely to use an office EHR system for viewing lab results electronically. Larger practices were more likely to gain this capacity of electronically viewing lab results earlier for their practice (see Figure 2.25). There were no significant differences for viewing lab results electronically by physician age or specialty for the year when practice started and by practice size for the method used.

Figure 2.24: Physicians Able to View Lab Results Electronically by Physician Age



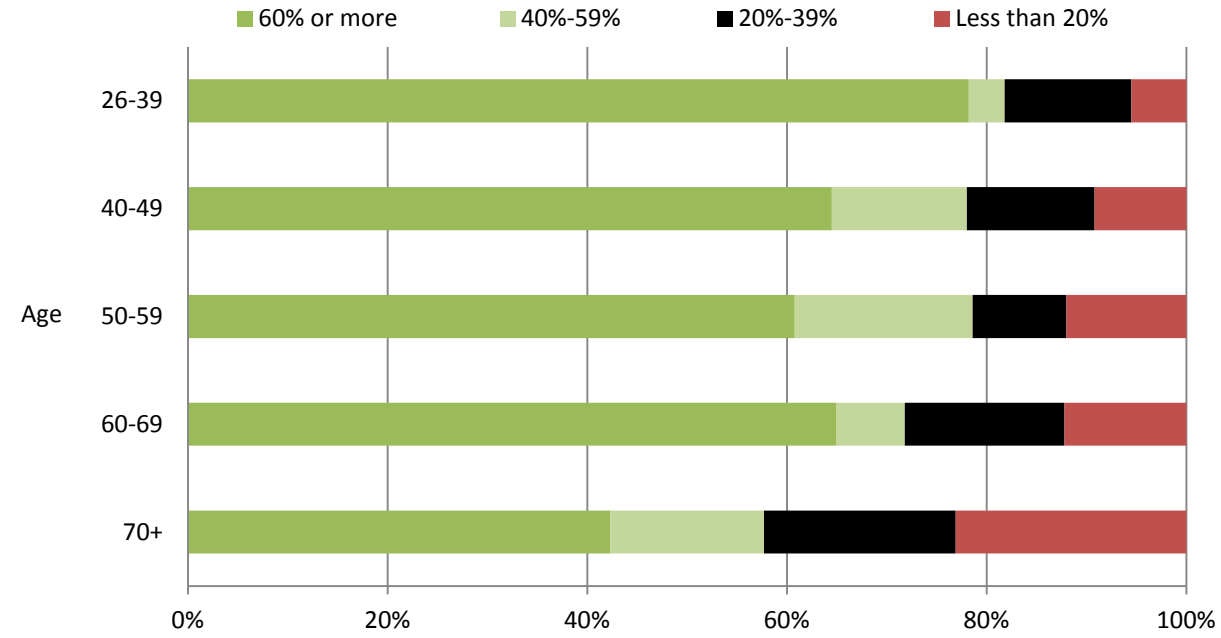
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.25: Year Physicians Began to View Lab Results Electronically by Practice Size



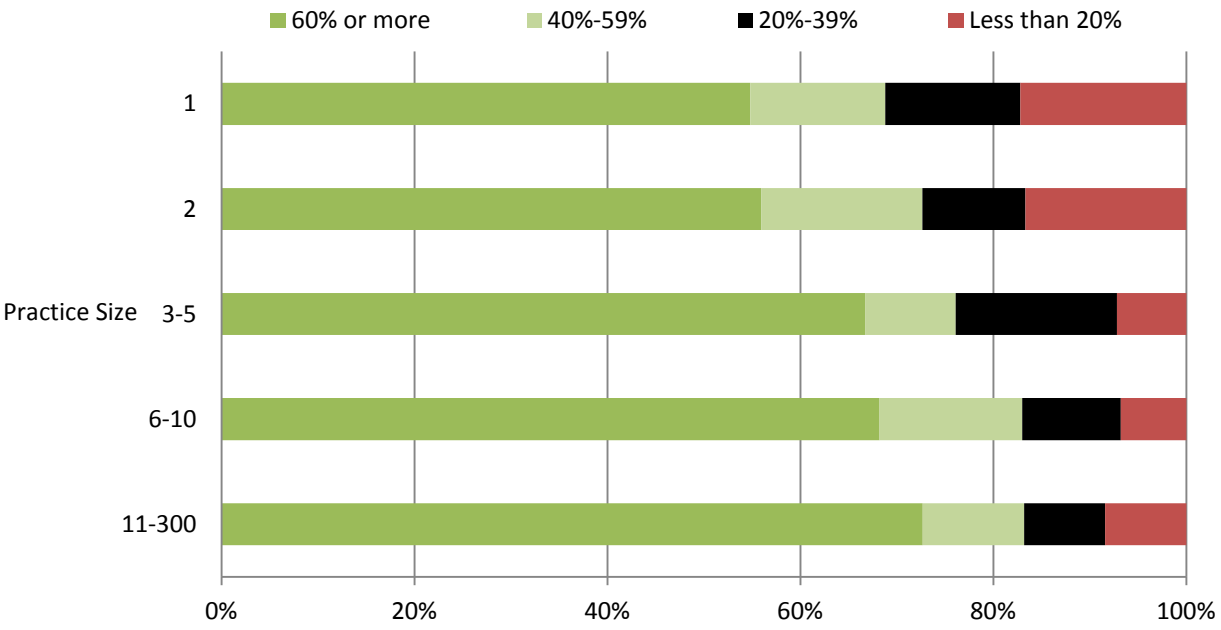
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.26: Percent of Lab Results Viewed Electronically by Physician Age
(includes only those who DO view lab results electronically)



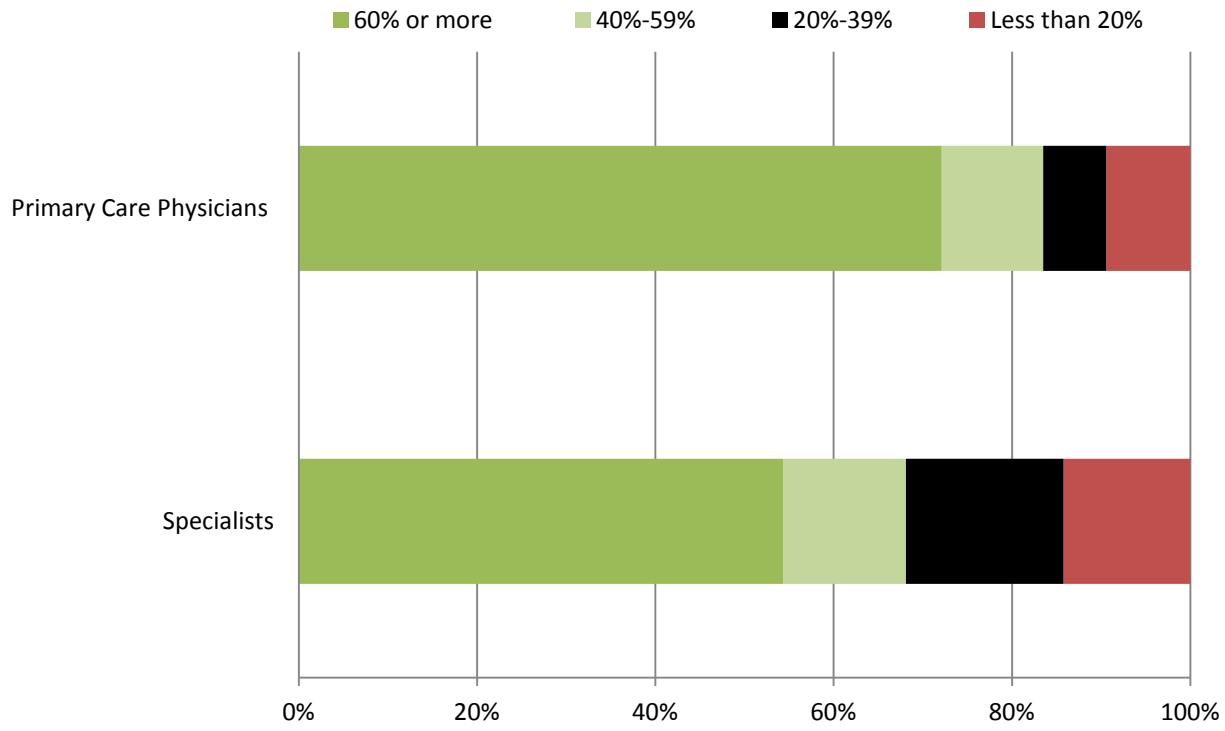
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.27: Percent of Lab Results Viewed Electronically by Practice Size
(includes only those who DO view lab results electronically)



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

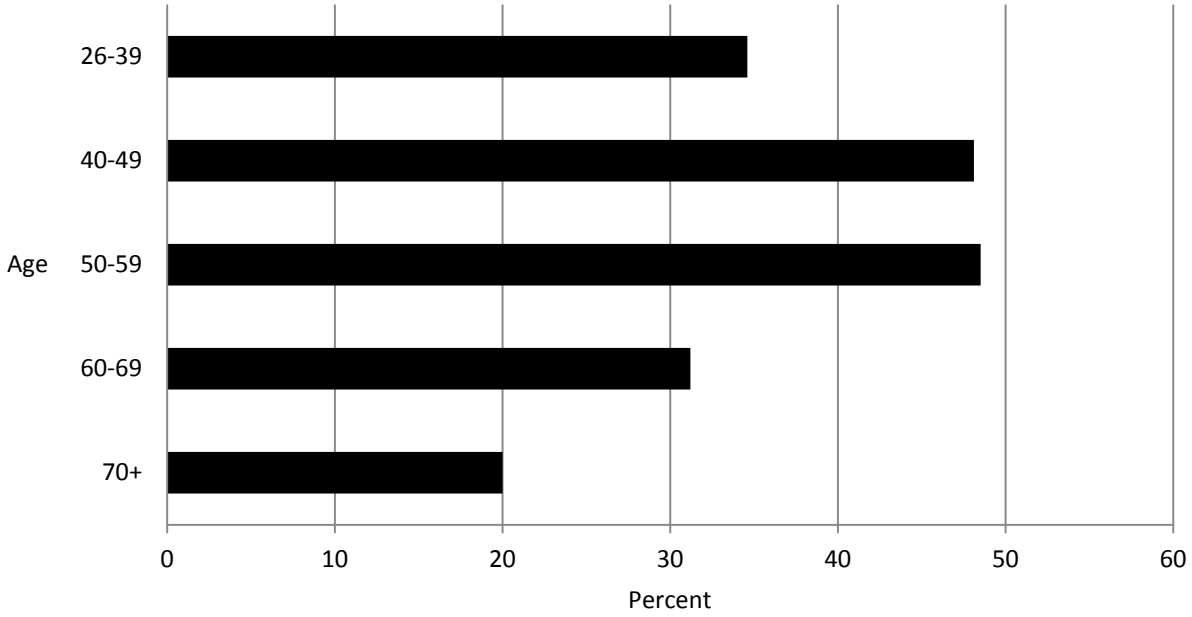
Figure 2.28: Percent of Lab Results Viewed Electronically by Specialty
(includes only those who DO view lab results electronically)



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

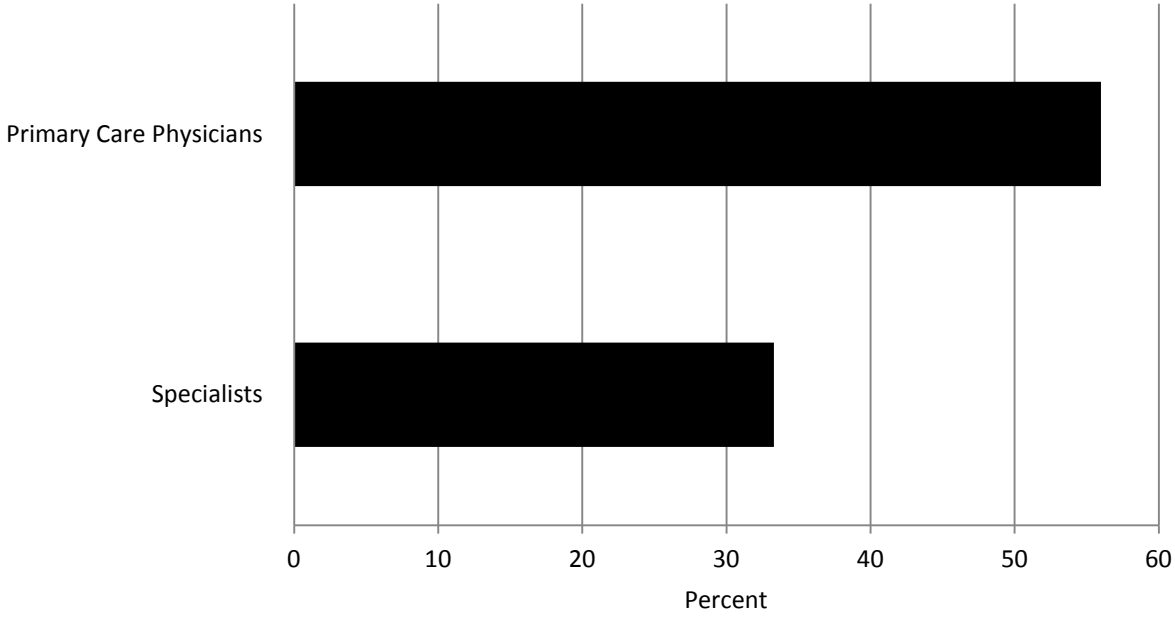
Among those not viewing lab results electronically, physicians ages 40-59 are more likely to plan to get this capability in the future (see Figure 2.29). Financial cost of the system (startup/ongoing) (see Figure 2.31) was more likely to be reported as the main reason for not viewing lab results electronically by all physician age groups (with the exception of physicians ages 40-49), and primary care physicians. Primary care physicians were more likely to gain this capability in the near future and specialists were more likely to gain this capability in 2015 (see Figure 2.30). There were no significant differences by physician age or practice size for plans to gain this capability in the future, or for practice size for the main reason for not viewing lab results electronically.

Figure 2.29: Percent of Physicians Who Plan to Be Able to View Lab Results Electronically in Near Future by Physician Age



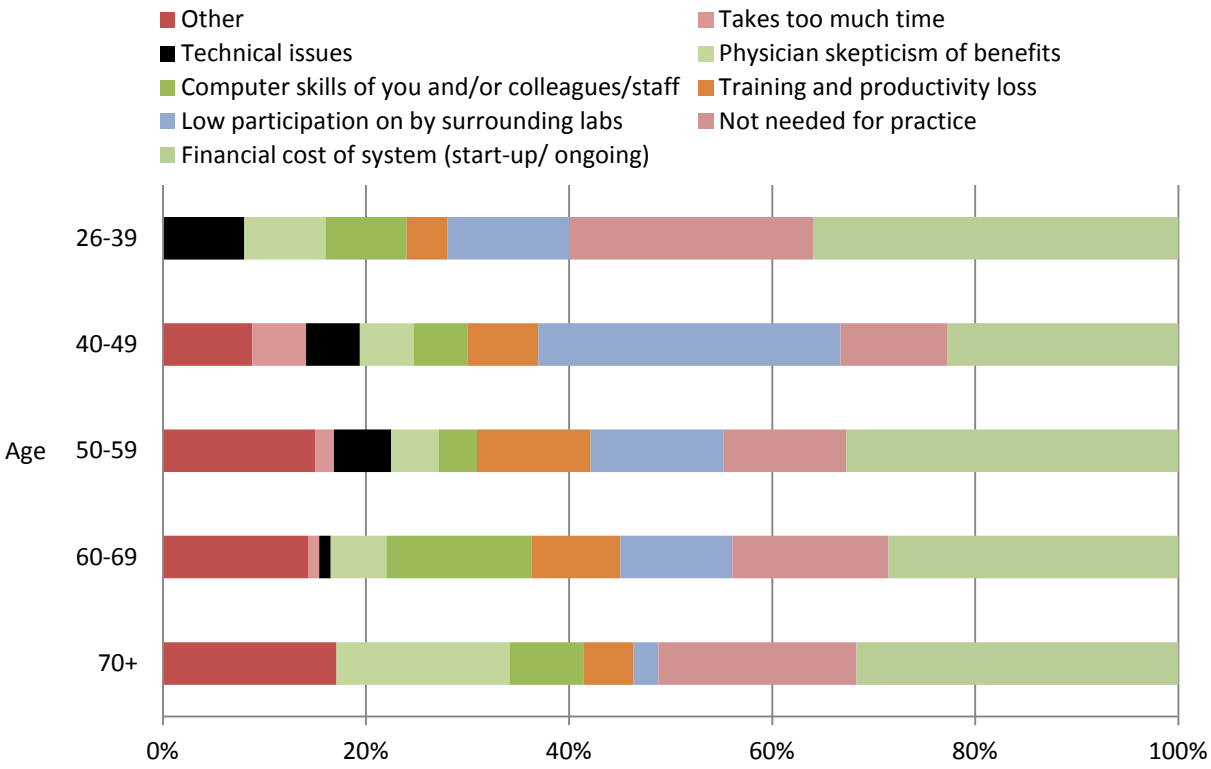
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.30: Percent of Physicians Who Plan to Be Able to View Lab Results Electronically in Near Future by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

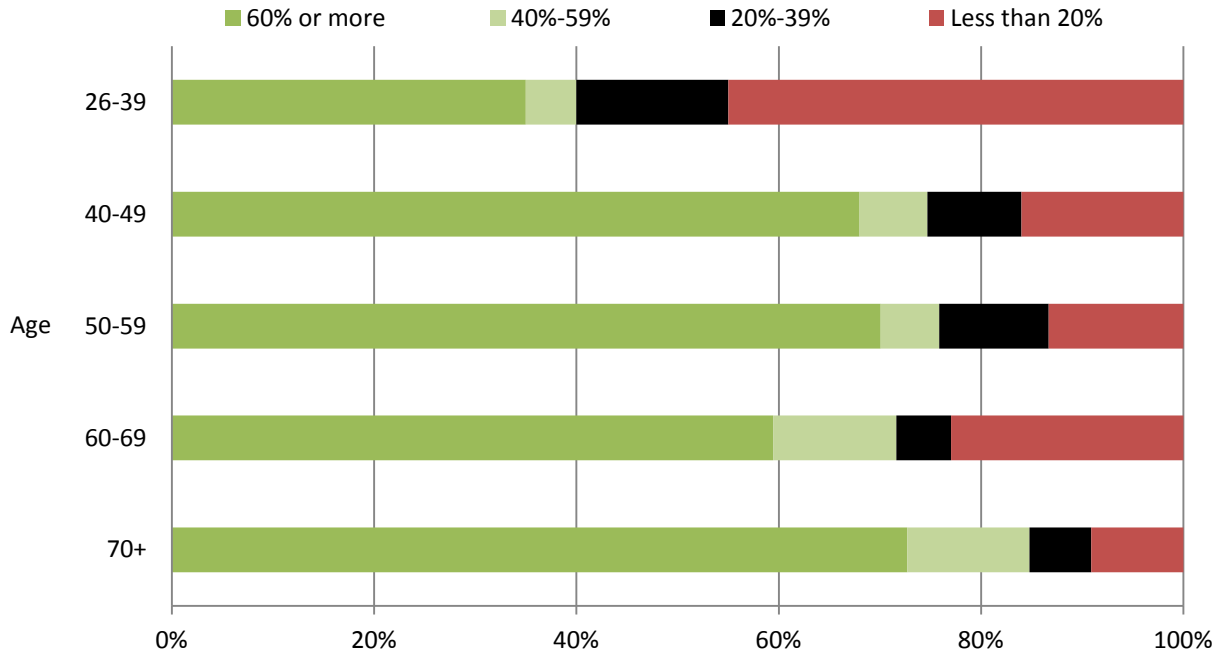
Figure 2.31: Main Reason for Not Being Able to View Lab Results Electronically by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

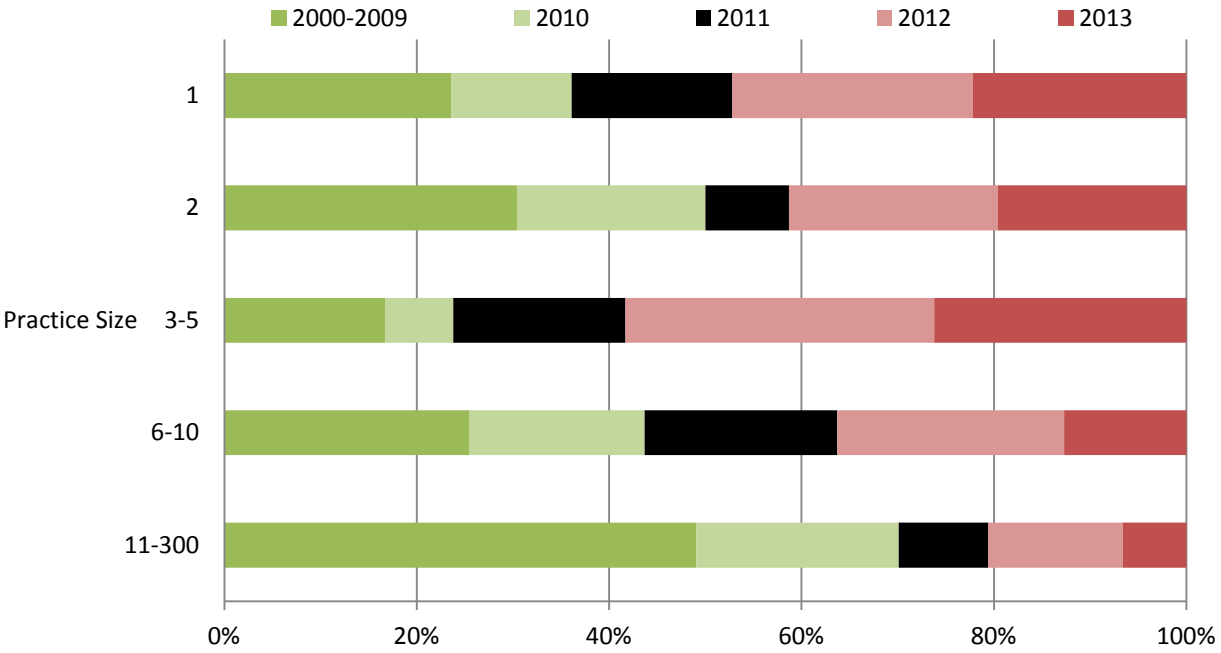
For sending lab results electronically, solo physicians and those in two-physician practices were significantly less likely to send lab test requests electronically. Specialists were about half as likely to do so, while physician age was unrelated to this capability. Physicians ages 70 and over (see Figure 2.32) were less likely to send 60% or more of their lab orders electronically and use an office EHR system to send lab requests (see Figure 2.34). Larger practices were more likely to gain the capacity to electronically send lab requests earlier for their practice. There were no significant differences for percentage of lab orders sent electronically and methods used to send the orders by physician specialty or practice size, nor for the year physicians started sending requests by specialty or physician age.

Figure 2.32: Percent of Lab Orders Sent Electronically by Physician Age



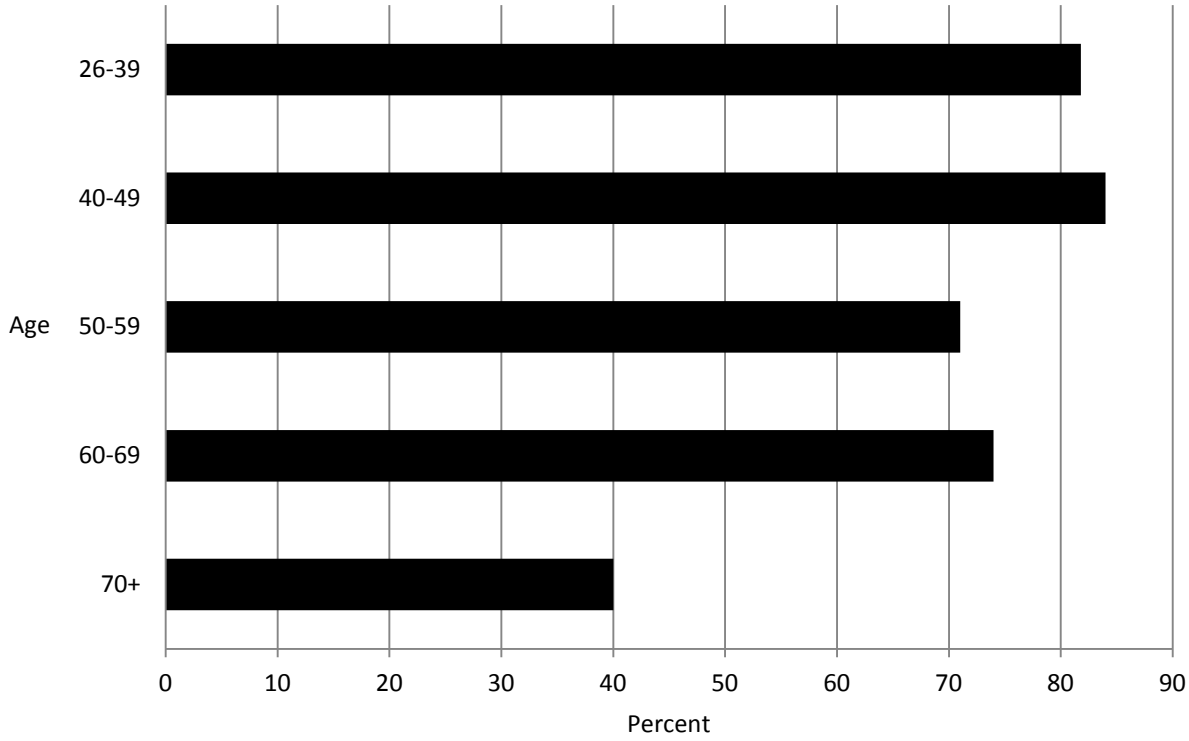
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.33: Year That Began Sending Lab Orders Electronically by Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

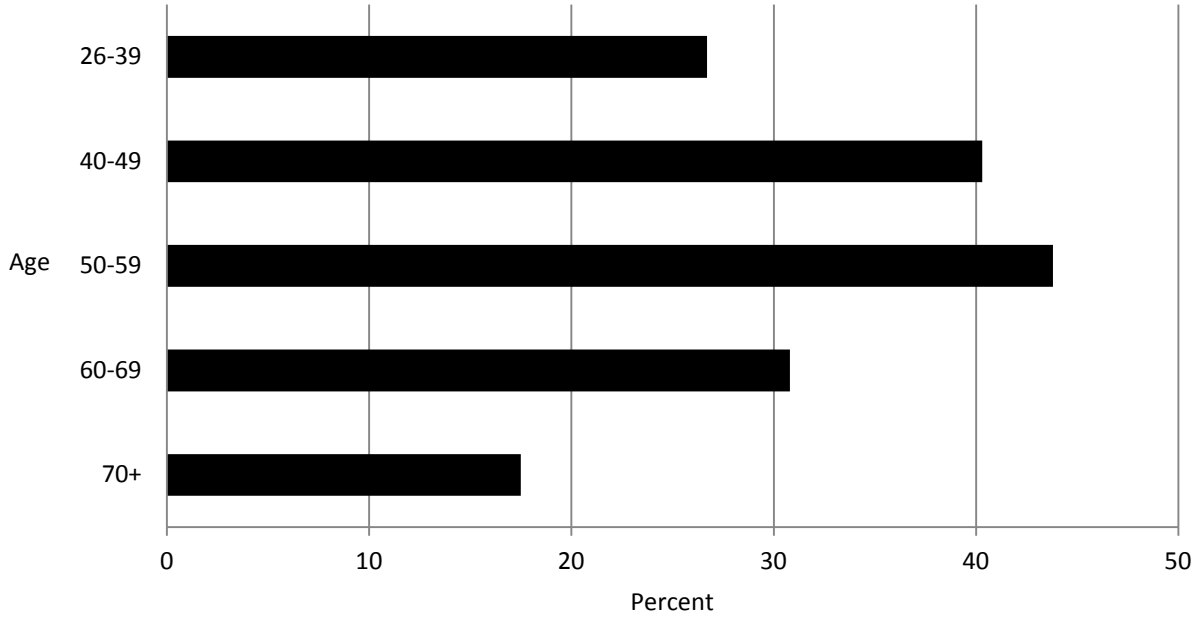
Figure 2.34: Physicians Who Send Lab Orders via Office EHR System by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

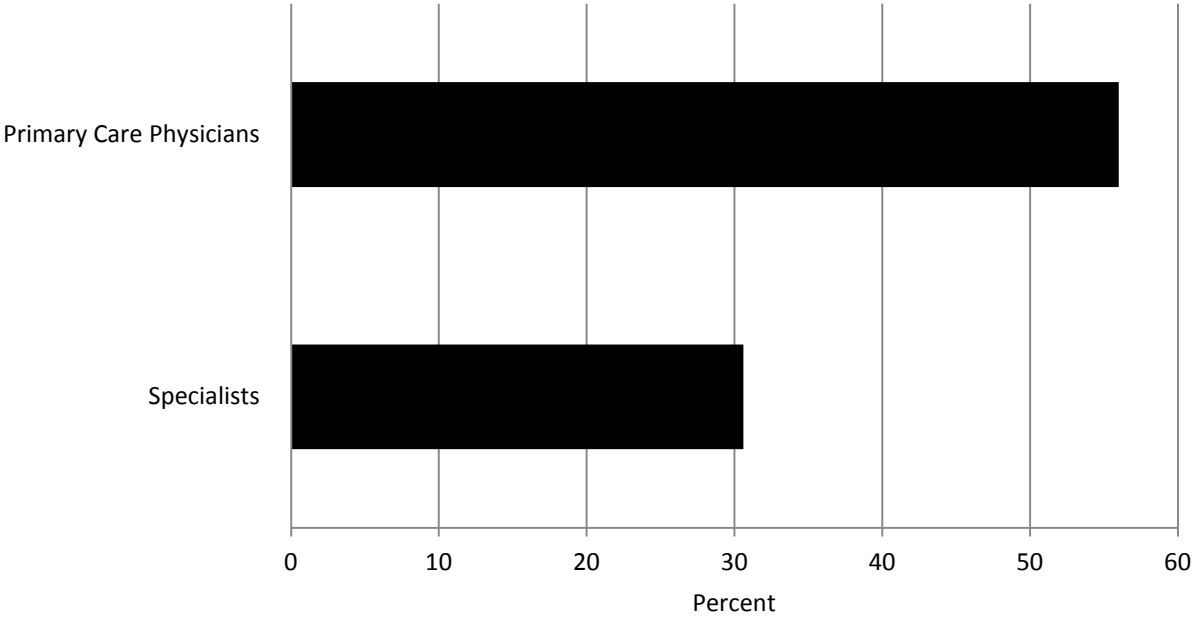
Among those not sending lab orders electronically, middle-aged physicians and primary care physicians were more likely to plan to gain this capability in the future (see Figures 2.35-2.36). There were no significant differences by practice size for future plans to send lab orders electronically, nor for physician age, practice size, or specialty for the year when physicians plan to gain this capability. Primary care physicians were more likely to report financial cost of the system (start-up/ongoing) as the main reason for not sending lab orders electronically. There were no significant differences by physician age or practice size for the main reason for not sending lab orders electronically.

Figure 2.35: Physicians Who Plan to Be Able to Send Lab Results Electronically in Near Future by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

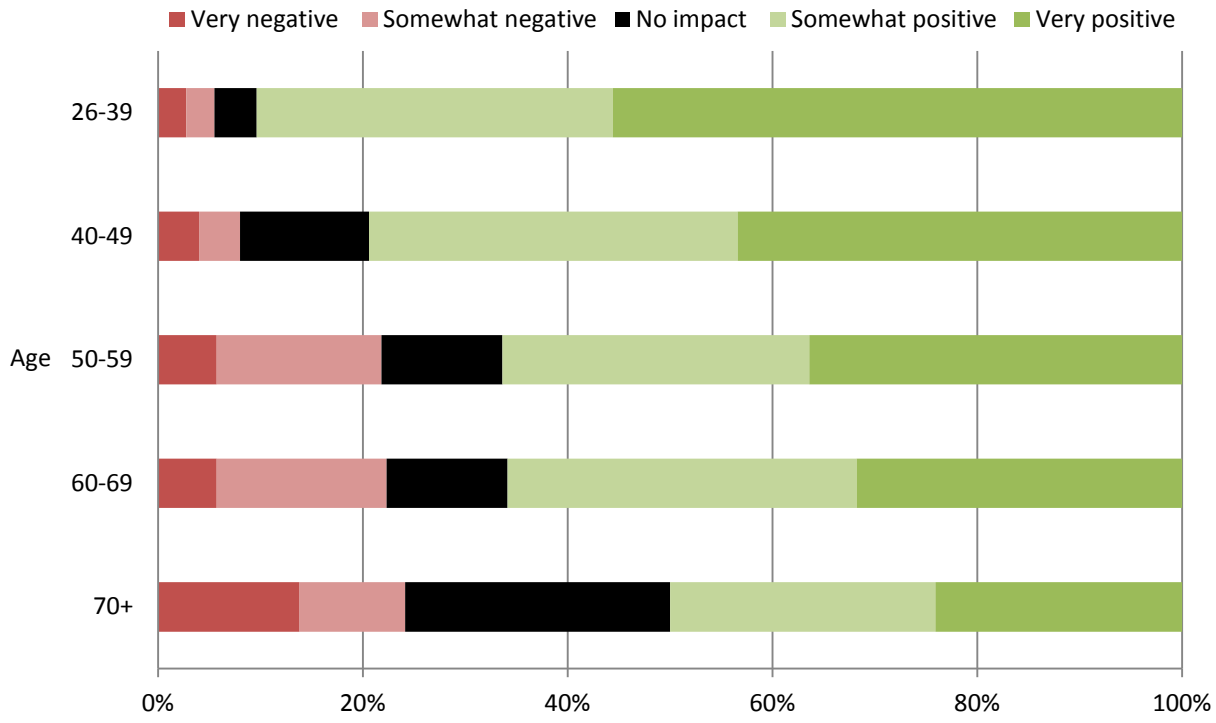
Figure 2.36: Percent of Physicians Who Plan to Be Able to Send Lab Results Electronically in Near Future by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

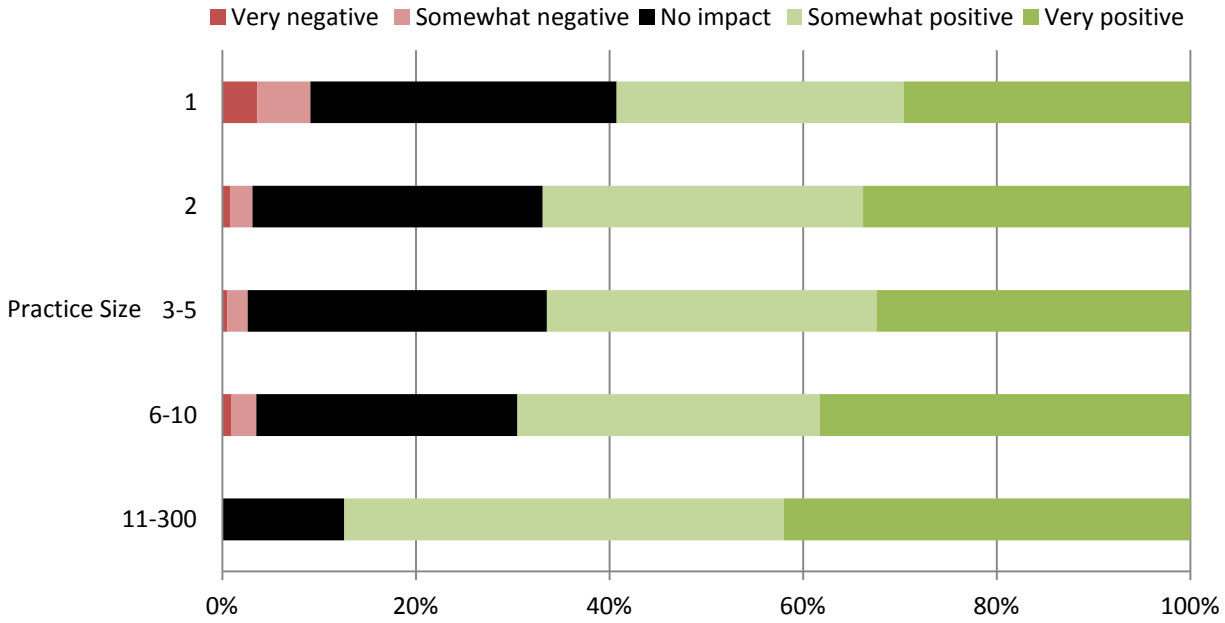
For the items used to assess the impact of electronic lab results/order entries on their practice (see Figures 2.37-2.39 for examples), as age increased, physicians were less likely to report a positive effect of electronically sending and viewing lab orders on their practice. Primary care physicians, across all measures, were more likely to report a positive impact of electronically sending and viewing lab orders on their practice. As practice size increased, across most measures (except for impact on overall healthcare costs), physicians were more likely to report a positive impact of electronically sending and viewing lab orders on their practice.

Figure 2.37: Effect of Electronic Lab Results/Order Entry on Practice Workflow Efficiency by Physician Age



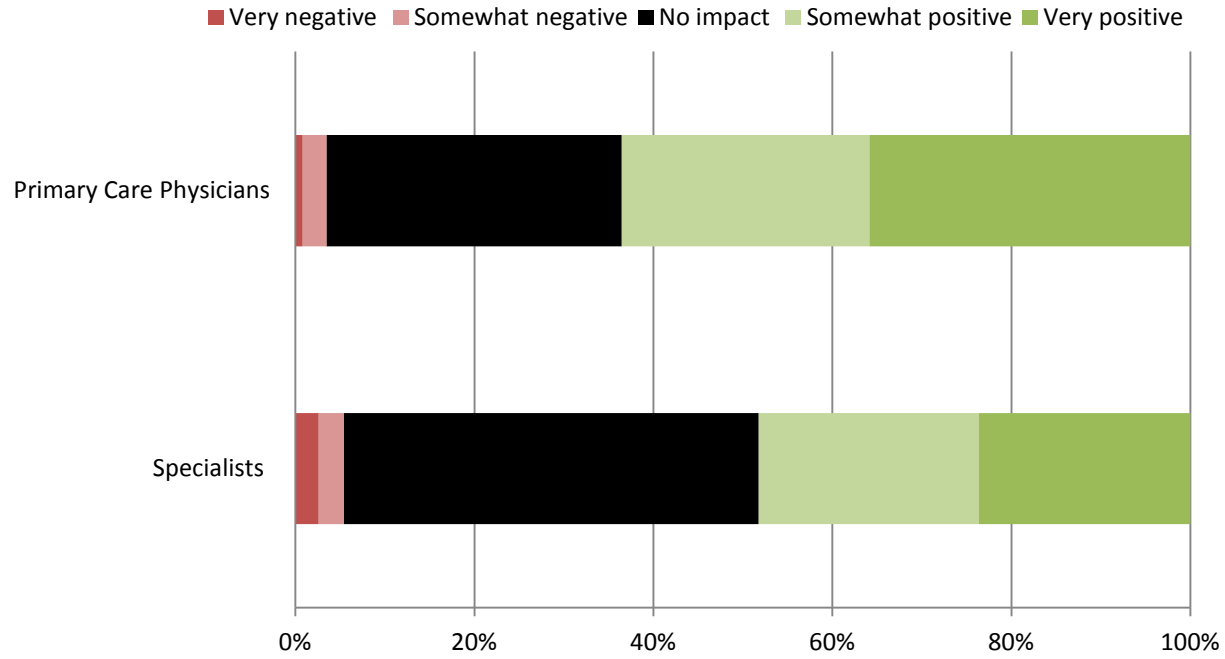
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.38: Effect of Electronic Lab Results/Order Entry on Care Coordination by Physician Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

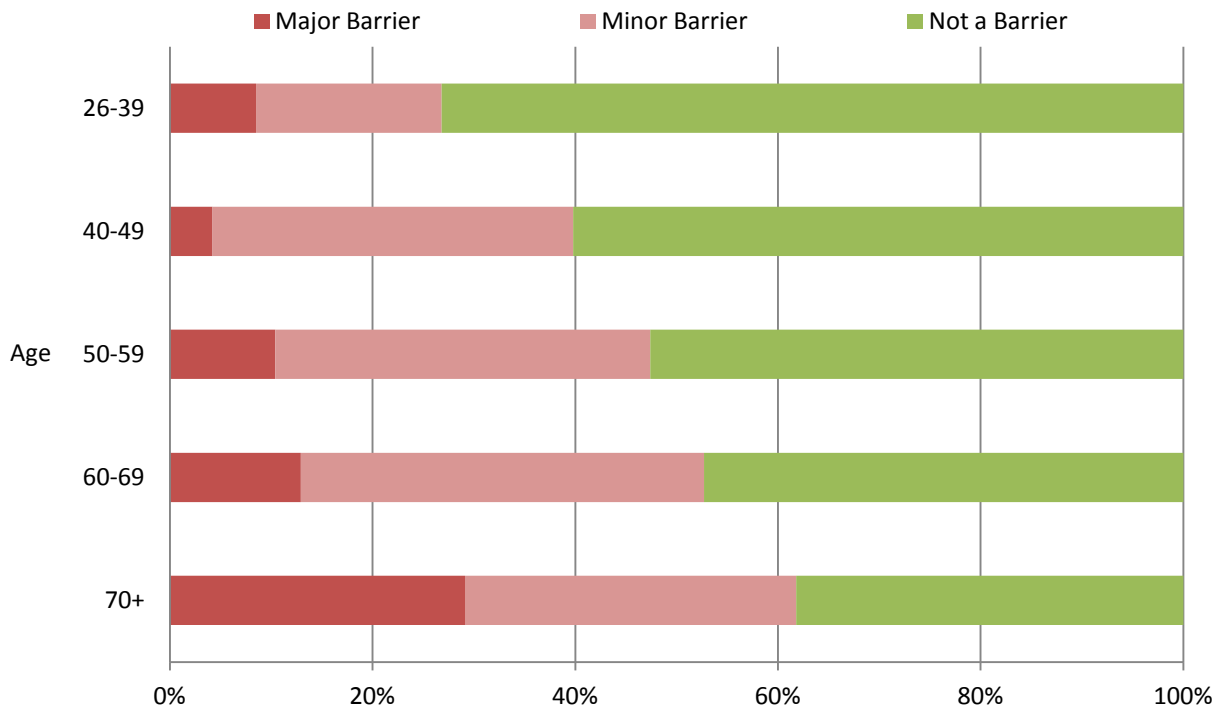
Figure 2.39: Effect of Electronic Lab Results/Order Entry on Patient Satisfaction by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

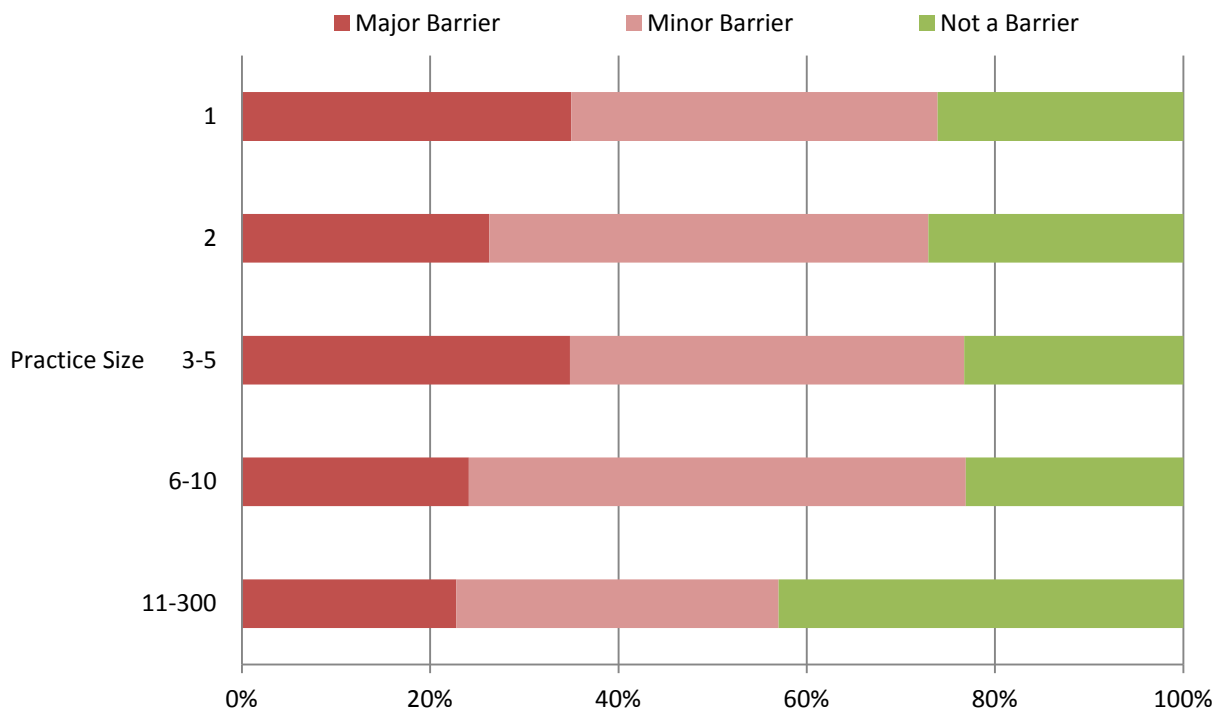
For barriers to beginning or expanding the use of electronic lab results/order entries in their practice (see Figures 2.40-2.41 for examples), computer skills of physician/staff, privacy or security concerns, and start-up financial costs were more likely to be reported as major barriers by physicians ages 60 and over. As age increased, ongoing financial costs, training (productivity loss), physician skepticism, and lack of time to acquire knowledge about systems were more likely to be reported as major or minor barriers by physicians. As practice size increased, physicians were less likely to report computer skills of physician/staff, computer technical support, privacy or security concerns, training (productivity loss), physician skepticism, lack of uniform standards, and technical limitations of systems as major barriers for beginning or expanding the use of electronic lab results/order entries for their practice. Solo physicians were more likely to report lack of time to acquire knowledge about systems as a major barrier for their practice. Lack of uniform standards was less likely to be reported as a major barrier by very large practices. Specialists were more likely to report privacy or security concerns, start-up financial costs, ongoing financial costs, low participation by area labs, and lack of uniform standards as minor or major barriers for their practice.

Figure 2.40: Barriers to Implementing or Expanding the Use of Electronic Lab Results/Order Entry: Physician Skepticism of Benefits by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 2.41: Barriers to Implementing or Expanding the Use of Electronic Lab Results/Order Entry: Technical Limitations of Health IT Systems by Physician Age



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Conclusions

Nearly two-thirds (62.6%) of NJ's physicians are currently viewing test results from clinical labs electronically, and nearly two-thirds (63.3%) of these view at least 60% of their lab results electronically, primarily through an office EHR system. Among those not viewing lab test results electronically (37.4%), 60.7% have no plans to view lab results electronically in the future. Financial costs are cited by about a third (32.3%) as the main reason for not viewing lab results electronically.

For sending lab test requests electronically, fewer participate (37.1%), but again, nearly two-thirds (65.5%) of these send at least 60% of their lab requests electronically, and again, primarily through an office EHR system. Among those not sending lab requests electronically (61.5%), about two-thirds (63.7%) have no plans to gain this capacity in the future. Financial costs are again cited most often (26.9%) as the main reason for not sending lab requests electronically, followed by low participation by surrounding labs (20.1%).

A large majority of physicians felt that electronic lab requests/results delivery would have a very or somewhat positive impact on most aspects of their practice. This was especially true for care coordination (77.6%) and information availability (77.0%). The exceptions were impact on overall healthcare costs and patient-doctor interaction where less than half (44.0% and 49.1%, respectively) thought it would have a positive impact.

For implementing or expanding the use of electronic lab requests/results delivery, start-up financial costs was the top barrier cited, with 43.0% of physicians saying it was a major barrier and another 30.6% saying it was a minor barrier. Physician skepticism, privacy or security concerns, computer skills of physician/staff, and low participation by area labs were rarely cited as major barriers.

Physicians ages 60 and over, solo physicians, and specialists were significantly less likely to view test results from clinical labs electronically. Primary care physicians and physicians in larger practices were more likely, whereas older physicians were less likely to view 60% or more of their lab results electronically. Larger practices were more likely to adopt electronically viewing lab results earlier for their practice. Among those not viewing lab results electronically, physicians ages 40-59 and primary care physicians are more likely to plan to get this capability in the future. Financial cost of the system (startup/ongoing) was more likely to be reported as the main reason for not viewing lab results electronically by all physician age groups (with the exception of physicians ages 40-49), and primary care physicians.

For sending lab results electronically, solo physicians and those in two-physician practices were significantly less likely to send lab test requests electronically. Specialists were about half as likely to do so, while physician age was unrelated to this capability. Larger practices were more likely to adopt electronically sending lab requests earlier for their practice. Among those not sending lab orders electronically, physicians ages 40-59, and primary care physicians were more likely to gain this capability in the future. Primary care physicians were more likely to report financial cost of the system (start-up/ongoing) as the main reason for not sending lab orders electronically.

Older physicians were less likely to report a positive effect of electronically sending and viewing lab orders on their practice. Primary care physicians and larger practices were more likely to report a positive impact of electronically sending and viewing lab orders on their practice.

For many barrier measures, older physicians were more likely and larger practices were less likely to report beginning or expanding the use of electronic lab results/order entry as major or minor barriers for their practice. Solo physicians were more likely to report lack of time to

acquire knowledge about systems as a major barrier, whereas specialists were more likely to report privacy or security concerns, financial costs of the system, low participation by area labs, and lack of uniform standards as minor or major barriers for their practice.

References

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Table 2.2: Item Frequencies, Section A: Methods Used to Receive Laboratory Orders

	N	%
Total	**76**	**100.0**
Labs that *accept* lab orders through EHR or CPOE system	**51**	**67.1**
Providers who submit electronic orders to NJ clinical laboratories		
<50%	15	32.6
50-99%	21	45.7
100%	10	21.7
Computerized provider order entry methods used by NJ clinical laboratories		
Office EHR system	35	68.6
E-mail	2	3.9
External Web portal	15	29.4
Other	21	41.2
Electronic standard(s) used for accepting lab orders		
LOINC	11	21.6
SNOMED-CT	6	11.8
HL7 v2.3.1	24	47.1
HL7 v2.5.1	12	23.5
HL7 v3	4	7.8
Other	3	5.9
Labs that *DO NOT accept* lab orders through EHR or CPOE system	**25**	**32.9**
How does this clinical laboratory accept lab orders from healthcare providers?		
Mail	8	32.0
Fax	12	48.0
In person	12	48.0
Other	8	32.0
Barriers to adopting electronic lab orders		
No currently available systems that satisfy the lab's needs	3	12.0
Product installation and ongoing operational costs	13	52.0
Decrease productivity during implementation	0	0.0
Too few healthcare providers with EHR or CPOE capabilities	7	28.0
Limited IT staff to support and electronic message ordering system	4	16.0
Limited use of uniform standards for lab order terminology standards	1	4.0
Other	2	8.0

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.2: Item Frequencies, Section A: Methods Used to Receive Laboratory Orders

(continued)

	N	%
Plan to accept electronic lab orders placed by an EHR or CPOE system	**13**	**52.0**
In the next 6 months	3	12.0
In the next 1 year	5	20.0
In the next 2 years	4	16.0
More than 2 years	1	4.0
No plans to implement in the future	12	48.0
Impact of electronic lab order entry (whether lab accepts electronic lab orders or not)		
Workflow efficiency		
Very positive	46	63.9
Somewhat positive	20	27.8
No impact	4	5.6
Somewhat negative	2	2.8
Very negative	0	0.0
Patient safety		
Very positive	42	59.2
Somewhat positive	17	23.9
No impact	9	12.7
Somewhat negative	3	4.2
Very negative	0	0.0
Overall healthcare costs		
Very positive	23	31.9
Somewhat positive	18	25.0
No impact	21	29.2
Somewhat negative	8	11.1
Very negative	2	2.8
Report accuracy		
Very positive	50	69.4
Somewhat positive	15	20.8
No impact	7	9.7
Somewhat negative	0	0.0
Very negative	0	0.0

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.2: Item Frequencies, Section A: Methods Used to Receive Laboratory Orders

(continued)

	N	%
Information availability		
Very positive	42	58.3
Somewhat positive	16	22.2
No impact	13	18.1
Somewhat negative	1	1.4
Very negative		
Care coordination		
Very positive	42	58.3
Somewhat positive	16	22.2
No impact	13	18.1
Somewhat negative	1	1.4
Very negative	0	0.0
Patient satisfaction		
Very positive	35	48.6
Somewhat positive	17	23.6
No impact	20	27.8
Somewhat negative	0	0.0
Very negative	0	0.0

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.3: Item Frequencies, Section B: Methods Used to Send Laboratory Results to Health Care Providers

	N	%
Total	**76**	**100.0**
Labs that are capable of sending test results electronically in a structured format	**65**	**86.7**
Method laboratory uses to share test results electronically with ordering practitioners		
Web portal provided by your laboratory	25	38.5
Web portal provided by a third party	17	26.2
Third party middleware vendor	9	13.8
Interface to health information organization	25	38.5
Interface to electronic health records (EHR)	44	67.7
Other	5	7.7
Electronic standard(s) used for reporting lab results		
LOINC	13	20.0
SNOMED-CT	8	12.3
HL7 v2.3.1	26	40.0
HL7 v2.5.1	15	23.1
HL7 v3	6	9.2
HL7 CDA document (unstructured)	0	0.0
HL7 CDA document (structured)	2	3.1
Other	8	12.3
Labs that are not capable of sending test results electronically in a structured format	**10**	**13.3**
Barriers to electronic delivery of laboratory results (whether lab send electronic results or not)		
EHR systems unable to receive structured results		
Not a barrier	3	42.9
Minor barrier	4	57.1
Major barrier	0	0.0
Insufficient information on exchange options available		
Not a barrier	4	57.1
Minor barrier	3	42.9
Major barrier	0	0.0
Lack of harmonization of industry accepted standards		
Not a barrier	3	42.9
Minor barrier	1	14.3
Major barrier	3	42.9

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.3: Item Frequencies, Section B: Methods Used to Send Laboratory Results to Health Care Providers

(continued)

	N	%
Inability of LIS to generate/receive electronic messages/transactions		
Not a barrier	3	37.5
Minor barrier	4	50
Major barrier	1	12.5
Subscription rates/fees for exchange service providers are too high		
Not a barrier	4	44.4
Minor barrier	1	11.1
Major barrier	4	44.4
Compliance with clinical lab improvement amendments (CLIA) regulations		
Not a barrier	4	50.0
Minor barrier	1	12.5
Major barrier	3	37.5
Time required to build interfaces		
Not a barrier	1	12.5
Minor barrier	4	50.0
Major barrier	3	37.5
Other		
Not a barrier	1	100.0
Minor barrier	0	0.0
Major barrier	0	0.0
Plan to implement electronic delivery of laboratory tests	**8**	**80.0**
In the next 6 months	4	40.0
In the next 1 year	2	20.0
In the next 2 years	2	20.0
More than 2 years	0	0.0
No plans to implement in the future	2	20.0
Other		
Impact of electronic lab results		
Workflow efficiency		
Very positive	60	83.3
Somewhat positive	6	8.3
No impact	3	4.2
Somewhat negative	2	2.8
Very negative	1	1.4

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.3: Item Frequencies, Section B: Methods Used to Send Laboratory Results to Health Care Providers

(continued)

	N	%
Patient safety		
Very positive	46	63.9
Somewhat positive	13	18.1
No impact	10	13.9
Somewhat negative	2	2.8
Very negative	1	1.4
Overall healthcare costs		
Very positive	29	40.8
Somewhat positive	15	21.1
No impact	17	23.9
Somewhat negative	7	9.9
Very negative	3	4.2
Report accuracy		
Very positive	49	69.0
Somewhat positive	9	12.7
No impact	12	16.9
Somewhat negative	0	0.0
Very negative	1	1.4
Information availability		
Very positive	54	75.0
Somewhat positive	16	22.2
No impact	1	1.4
Somewhat negative	0	0.0
Very negative	1	1.4
Care coordination		
Very positive	48	66.7
Somewhat positive	15	20.8
No impact	7	9.7
Somewhat negative	1	1.4
Very negative	1	1.4
Patient satisfaction		
Very positive	39	54.2
Somewhat positive	16	22.2
No impact	16	22.2
Somewhat negative	0	0.0
Very negative	1	1.4

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.4: Item Frequencies, Section C: Methods Used to Send Laboratory Results to NJ Department of Health (DOH)

	N	%
Total	**76**	**100.0**
Labs that send test results electronically to NJ DOH	**28**	**40**
Electronic standard(s) lab is capable of using		
LOINC	11	39.3
SNOMED-CT	10	35.7
HL7 v2.3.1	10	35.7
HL7 v2.5.1	8	28.6
HL7 v3	1	3.6
HL7 CDA document (unstructured)	0	0.0
HL7 CDA document (structured)	1	3.6
Data entry into DOH registry	6	21.4
Other	4	14.3
Labs that DO NOT send test results electronically to NJ DOH	**42**	**55.3**
Plan to implement electronic reporting to NJ DOH	**21**	**55.3**
Not applicable	10	26.3
In the next 6 months	8	21.1
In the next 1 year	10	26.3
In the next 2 years	3	7.9
More than 2 years	0	0.0
No plans to implement electronic reporting to NJ DOH	7	18.4
Other	0	0.0

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.5: Item Frequencies, Section D: Methods Used to Send Laboratory Results to Patients

	N	%
Total	**76**	**100.0**
Labs that allow patients direct access to results	**27**	**37.5**
Methods used to send test results directly to patients		
Mail	18	66.7
Fax	9	33.3
Web portal solution provided by laboratory	4	14.8
Transmission of results to a designated personal health record (PHR)	4	14.8
Through a community health information organization (HIO) that provides patient access to information	6	22.2
Through a physician's EHR that provides patient access	4	14.8

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.6: Item Frequencies, Section E: Health Information Exchange with Health Information Organizations (HIOs)

	N	%
Total	**76**	**100.0**
Labs sharing structured lab data electronically with any NJ HIO	**19**	**26.8**
HIOs laboratories are sharing structured data with		
Camden Coalition	2	10.5
Health-e-cITi-NJ	2	10.5
Jersey Health Connect	10	52.6
NJSHINE	2	10.5
Trenton HIE	1	5.3
Virtua	1	5.3
Other	1	5.3

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.7: Item Frequencies, Section F: General Information

	N	%
Total	**76**	**100.0**
Job title of respondent		
Laboratory Director	18	24.7
Laboratory Manager	23	31.5
Laboratory Information Systems Director	8	11.0
Medical Laboratory Technician or Clinical Laboratory Technician	1	1.4
Medical Technologist or Clinical Laboratory Scientist	1	1.4
Staff Pathologist	0	0.0
Chief Information Officer	1	1.4
Other	21	28.8
Number of FTEs in the laboratory		
None	3	4.3
1 to 5	17	24.3
6 to 10	4	5.7
11 to 15	5	7.1
16 to 30	7	10.0
31 to 45	7	10.0
46 to 60	15	21.4
61 or more	12	17.1
Type of laboratory facility		
Commercial/Independent lab	28	37.3
Hospital lab	41	54.7
Public health facility	3	4.0
Other	3	4.0
Annual test volume, 2012		
0	5	8.2
1-100,000	21	34.4
100,000-499,000	9	14.8
500,000-999,000	8	13.1
1-4.99 million	16	26.2
5 million +	2	3.3

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.7: Item Frequencies, Section F: General Information

(continued)

	N	%
LIS technology related skills and/or roles in greatest need (whether laboratories accept/send electronic lab orders/results delivery or not)		
A person to lead the implementation/upgrade of the LIS	18	23.7
People to help design, customize, and/or maintain an LIS for use in our clinical laboratory	17	22.4
People to help modernize an existing LIS to enable standards-based exchange of electronic orders and results delivery	16	21.1
People to map test names and test results to LOINC and SNOMED codes	21	27.6
Computer/IT personnel	14	18.4
Laboratory persons who bridge knowledge between IT and lab (laboratory informaticians)	36	47.4
People to train staff on how to use the LIS	20	26.3
Other	4	5.26
No workforce issues	19	25.0

Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 2.8: Item Frequencies, Section B: Physician Use of Electronic Lab Results

	N	%
Total	**958**	**100.0**
Physicians that DO view lab results electronically from main practice location	**590**	**62.6**
When began viewing lab results electronically		
Before 2010	166	29.7
2010	73	13.1
2011	77	13.7
2012	148	26.4
2013	95	17.0
% of lab results viewed electronically		
<20%	68	11.8
20-39%	71	12.3
40-59%	73	12.7
60%+	367	63.3
Mode used for viewing lab results		
Office EHR system	441	46.1
External web portal	157	16.4
Email	13	1.3
Other	66	6.9
Physicians that DO NOT view lab results electronically from main practice location	**353**	**37.4**
Plans to view lab results electronically in near future		
In 2014	85	26.5
In 2015	21	6.5
After 2015	5	1.6
No plans to view lab results electronically	195	60.7
Main reason for not viewing lab results electronically		
Financial cost of system (start-up / ongoing)	105	32.3
Low participation by surrounding labs	46	14.2
Computer skills of you and/or colleagues/staff	28	8.5
Training and productivity loss	29	8.8
Physician skepticism of benefits	28	8.5
Don't use labs often	47	14.5
Other	43	13.2

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 2.8: Item Frequencies, Section B: Physician Use of Electronic Lab Results

(continued)

	N	%
Physicians that DO send lab test requests electronically from main practice location	**347**	**37.1**
When began sending lab results electronically		
Before 2010	84	26.9
2010	43	13.9
2011	47	15.2
2012	75	24.2
2013	62	19.8
% of lab results sent electronically		
<20%	59	17.6
20-39%	29	8.6
40-59%	27	8.2
60%+	219	65.5
Mode used for sending lab results		
Office EHR system	254	73.2
External web portal	65	18.7
Email	4	1.1
Other	43	12.3
Physicians that DO NOT send lab test requests electronically from main practice location	**589**	**61.5**
Plans to send lab results electronically in near future		
In 2014	119	22.5
In 2015	31	5.9
After 2015	15	2.8
No plans to send lab results electronically	337	63.7
Main reason for not sending lab results electronically		
Financial cost of system (start-up / ongoing)	142	26.9
Low participation by surrounding labs	106	20.1
Computer skills of you and/or colleagues/staff	44	8.3
Training and productivity loss	43	8.2
Physician skepticism of benefits	53	9.9
Don't use labs often	56	10.6
Other	69	13.0

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 2.8: Item Frequencies, Section B: Physician Use of Electronic Lab Results

(continued)

	N	%
Impact of electronic lab requests/results delivery (whether currently using or not)		
Workflow efficiency		
Very positive	317	35.7
Somewhat positive	283	31.8
No impact	108	12.1
Somewhat negative	132	14.9
Very negative	48	5.4
Patient safety		
Very positive	294	33.1
Somewhat positive	268	30.2
No impact	274	30.9
Somewhat negative	33	3.7
Very negative	19	2.1
Overall healthcare costs		
Very positive	175	20.0
Somewhat positive	209	24.0
No impact	322	36.8
Somewhat negative	107	12.2
Very negative	61	7.0
Report accuracy		
Very positive	300	33.9
Somewhat positive	283	32.0
No impact	271	30.7
Somewhat negative	22	2.5
Very negative	9	1.0
Information availability		
Very positive	387	44.0
Somewhat positive	291	33.0
No impact	162	18.4
Somewhat negative	27	3.1
Very negative	13	1.5
Care coordination		
Very positive	303	34.2
Somewhat positive	295	33.4
No impact	244	27.7
Somewhat negative	27	3.0
Very negative	15	1.7

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 2.8: Item Frequencies, Section B: Physician Use of Electronic Lab Results

(continued)

	N	%
Patient satisfaction		
Very positive	256	29.0
Somewhat positive	229	25.8
No impact	359	40.6
Somewhat negative	24	2.7
Very negative	16	1.8
Patient-doctor interaction		
Very positive	235	26.5
Somewhat positive	200	22.6
No impact	353	39.9
Somewhat negative	66	7.5
Very negative	31	3.5
Barriers to implementing or expanding use of electronic lab requests/results delivery (whether currently using or not)		
Computer skills of you/staff		
Not a barrier	392	45.2
Minor barrier	341	39.4
Major barrier	133	15.3
Computer technical support		
Not a barrier	263	30.5
Minor barrier	370	42.8
Major barrier	231	26.8
Privacy or security concerns		
Not a barrier	447	51.9
Minor barrier	283	32.9
Major barrier	130	15.1
Start-up financial costs		
Not a barrier	227	26.4
Minor barrier	263	30.6
Major barrier	369	43.0
Ongoing financial costs		
Not a barrier	217	25.3
Minor barrier	320	37.3
Major barrier	321	37.4

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 2.8: Item Frequencies, Section B: Physician Use of Electronic Lab Results

(continued)

	N	%
Training, productivity loss		
Not a barrier	232	26.9
Minor barrier	361	42.0
Major barrier	267	31.0
Physician skepticism		
Not a barrier	447	53.6
Minor barrier	296	35.5
Major barrier	91	10.9
Lack of time to acquire knowledge about systems		
Not a barrier	268	32.3
Minor barrier	364	43.9
Major barrier	198	23.9
Low participation by area labs		
Not a barrier	376	48.7
Minor barrier	276	35.7
Major barrier	120	15.5
Lack of uniform standards within industry (multiple systems)		
Not a barrier	211	26.1
Minor barrier	274	33.8
Major barrier	326	40.1
Technical limitations of systems		
Not a barrier	223	27.7
Minor barrier	342	42.4
Major barrier	242	29.9

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Chapter 3: Physician Use of Electronic Health Records (EHRs): An Analysis of the 2013 Physician Survey

Introduction

An Electronic Health Record (EHR) is a longitudinal electronic version of a patient's health information generated by encounters in a health care delivery setting. EHRs have the potential to assist providers in delivering higher, more efficient quality care to their patients. Basic EHR systems are able to manage administrative and clinical data containing patient demographics, patient history, health problem list, clinical notes, vital signs, comprehensive lists of patient's medication and allergies, computerized orders for prescriptions, and the ability to view lab and imaging results electronically (Donelan and Miralles 2008). Among others, there are three particular EHR functionalities that hold promise in improving quality care and reducing health care costs: clinical decision support tools (CDS), computerized physician order entry systems (CPOE), and health information exchange (HIE). The HITECH Act was signed into law with the explicit purpose of incentivizing physicians to adopt an EHR system and the requirement to utilize them in a meaningful way with key functionalities (Blumenthal and Tavenner 2010).

A recent national, office-based physician workflow study found that most physicians with an EHR system reported that EHR use enhanced patient care overall and clinical benefits were more likely reported by those with longer EHR experience and meeting meaningful use criteria (King et al. 2014). In 2013 about 78% of office-based U.S. physicians used some type of EHR system and about 48% of physicians reported having a system that met the criteria for a basic EHR system according to data from the National Ambulatory Medical Care Survey (Hsiao and Hing 2014). Those data show an upward trend in adoption with a sharper increase since the implementation of the HITECH ACT. Also in the NAMCS data, New Jersey physicians report significantly lower than average rates of adoption for either a basic EHR system or any type of EHR System (Hsiao and Hing 2014).

Methods

The 2013 physician survey is described above under Chapter 1. This report contains frequencies of all survey items from Section E. Topics of interest such as use of EHRs, EHR vendor used, when EHR system installed, EHR certification, and receipt of incentive for meaningful use of

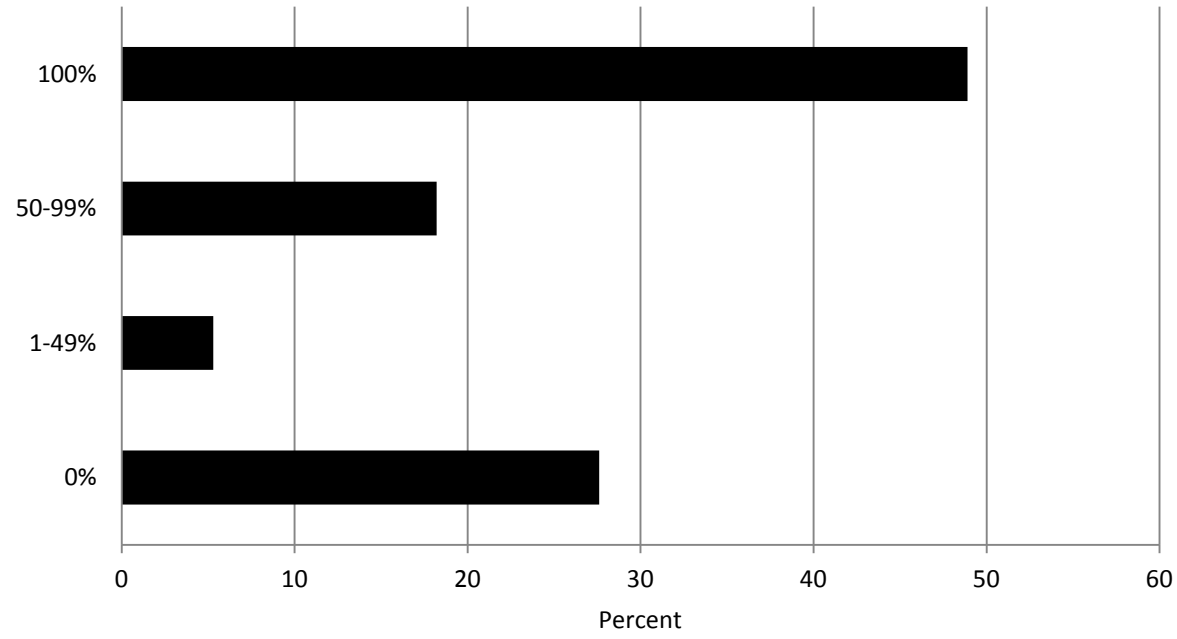
EHRs were analyzed by key physician and practice characteristics (physician age, practice size, primary specialty groups).

The respondents indicated their best estimate for the percent of patient records that were maintained on an EHR system at their practice, percent of patients who were provided a clinical summary from an EHR, and percent of patients for whom a clinical summary of care document was used for transitions of care. Responses were then collapsed into the following four categories: 0%, 1-49%, 50-99%, and 100% of patients. Plans to implement an EHR system in the near future was collapsed into three categories: in 2014, 2015 or later, no plans to implement. Due to the large number of different EHR vendors reported, the findings for the use of primary EHR vendor at main practice includes only vendors that were used by ≥2 % of the physicians surveyed.

Findings

Table 4.1 and Figures 3.1-3.7 contain the weighted frequencies for the physician survey items related to the use of an EHR. Figures 3.8-3.15 contain examples of significant crosstabs of use of EHRs, EHR vendor used, when EHR system was installed, EHR certification, and receipt of incentive for meaningful use of EHRs by key physician and practice characteristics (physician age, practice size, primary specialty groups).

Figure 3.1: Percentage of Patient Records at Main Practice Maintained on an EHR System

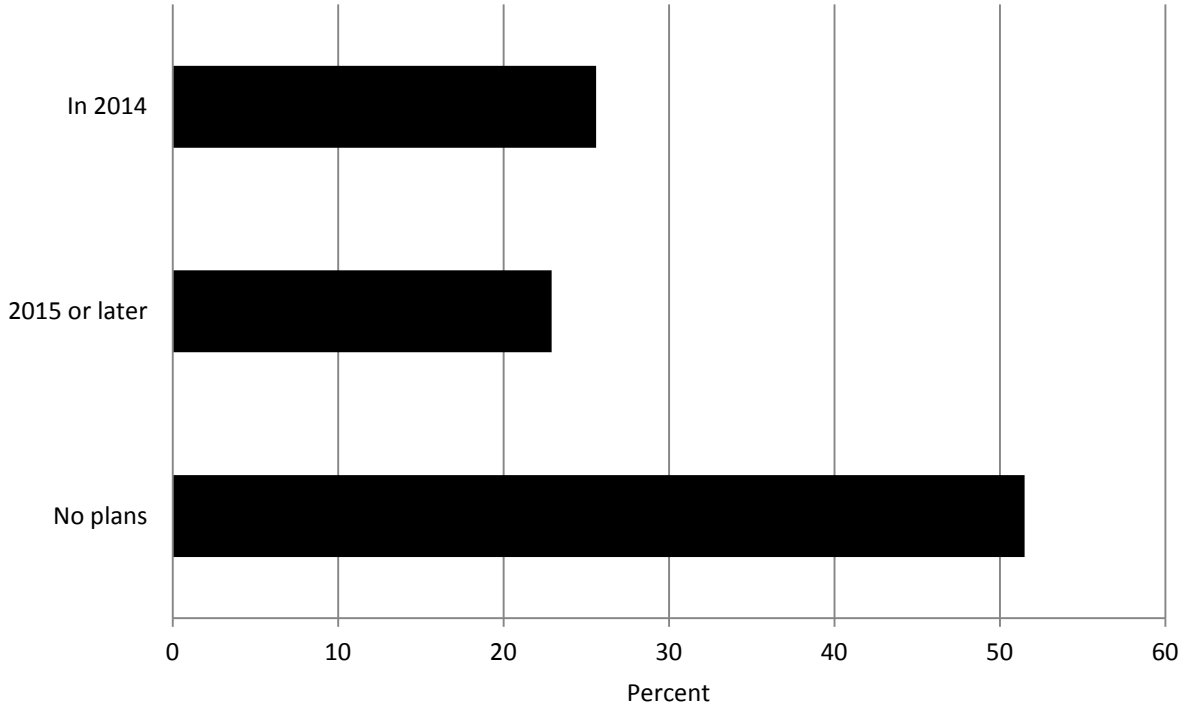


Source: 2013 New Jersey Physician HIT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Nearly half (48.9%) of NJ's physicians maintained 100% and almost one-fifth (18.2%) maintained 50-99% of their patient records on an EHR system (see Figure 3.1). However, more than one-fourth (27.6%) did not maintain any of their patient records on an EHR system.

Among those not who have not yet implemented an EHR system, about half plan to gain this capability in the future (25.6 % in 2014; 22.9% in 2015 or later); however, 51.1% have no plans to implement an EHR system in the future (see Figure 3.2).

Figure 3.2: Physicians Who Plan to Implement an EHR System in Near Future

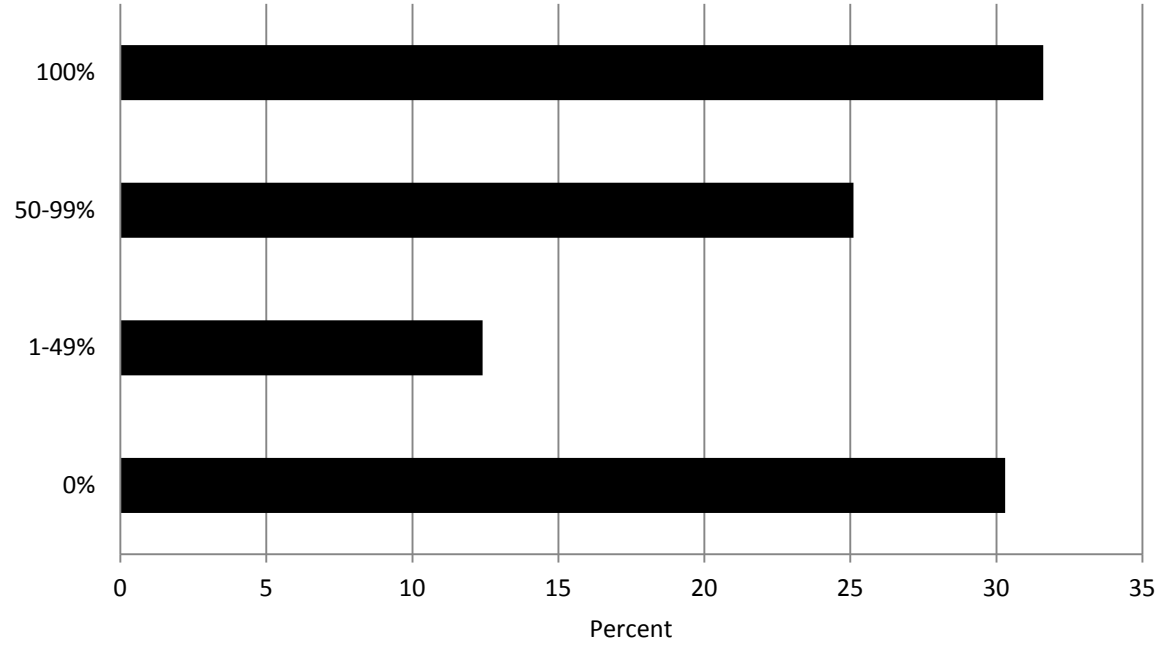


Source: 2013 New Jersey Physician HIT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Among those with at least some patient records maintained on an EHR system:

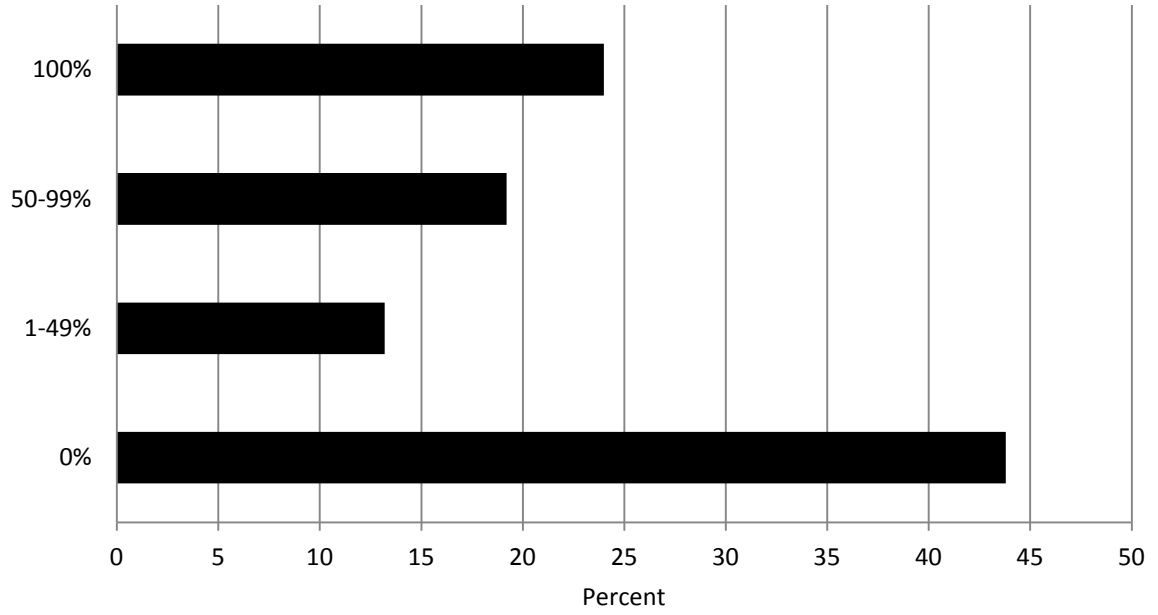
- Nearly one-third (31.6%) provide a clinical visit summary from their EHR to 100% of their patients, and one-fourth (25.1%) provide it 50-99% of their patients (see Figure 3.3). However, 30.3% did not provide a clinical visit summary at all to their patients.
- For the summary of care document for transitions of care, nearly one-fourth (24.0%) use it for 100% of the patients, and one-fifth (19.2%) use it for 50-99% of their patients (see Figure 3.4). However, 43.8% did not use a summary of care document for transitions of care at all for their patients.

Figure 3.3: Percentage of Patients Provided a Clinical Visit Summary



Source: 2013 New Jersey Physician HIT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

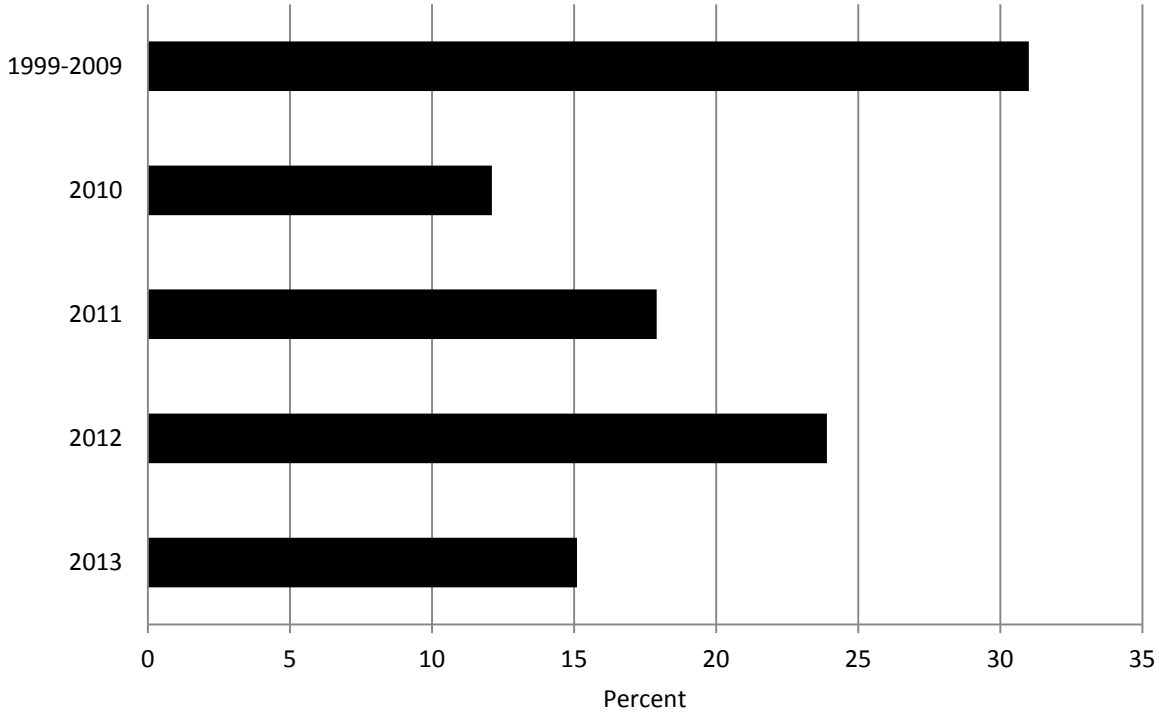
Figure 3.4: Percentage of Patients for Whom a Summary of Care Document Is Used for Transitions of Care



Source: 2013 New Jersey Physician HIT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

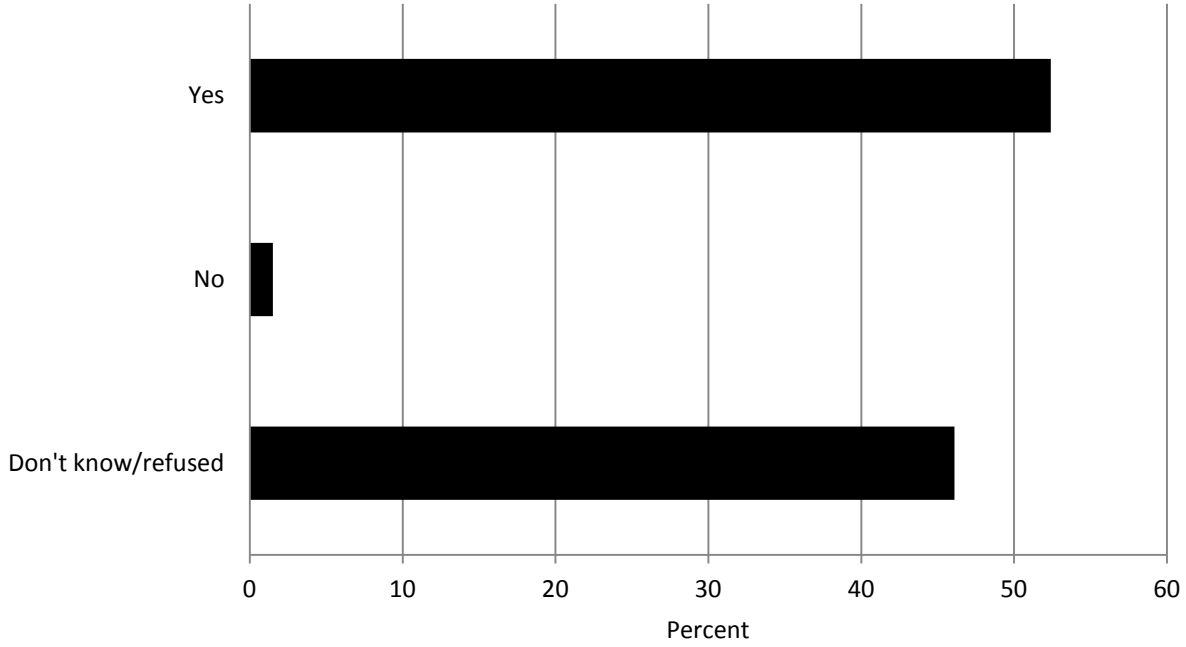
- For the primary EHR system vendor used in their practice, six in 10 cited "Other" as their primary vendor. Some other commonly used vendors (used by ≥2% of physicians) were eClinicalWorks (9.3%), Practice Fusion (7.2%), Allscripts (6.5%), GE Healthcare (6.5%), NextGen (4.0%), Cerner (2.5%), and Vitera (2.3%).
- Nearly one-third (31.0%) installed their EHR system before 2009, 23.9% did so in 2012, and 15.1% in 2013 (see Figure 3.5).
- More than half (52.4%) used an EHR system that has been certified by the Certificate Commission on Health Information Technology (CCHIT) (see Figure 3.6). However, 46.1% were unaware if their system was CCHIT-certified or refused to answer.
- More than half of physicians (52.1%) received an incentive payment from the Centers for Medicare and Medicaid Services (CMS) for the adoption and/or meaningful use of a certified EHR (see Figure 3.7). The rest either did not receive any payment (26.2%) or were unaware (21.8%) if they received it.

Figure 3.5: Year EHR System Implemented at Main Practice



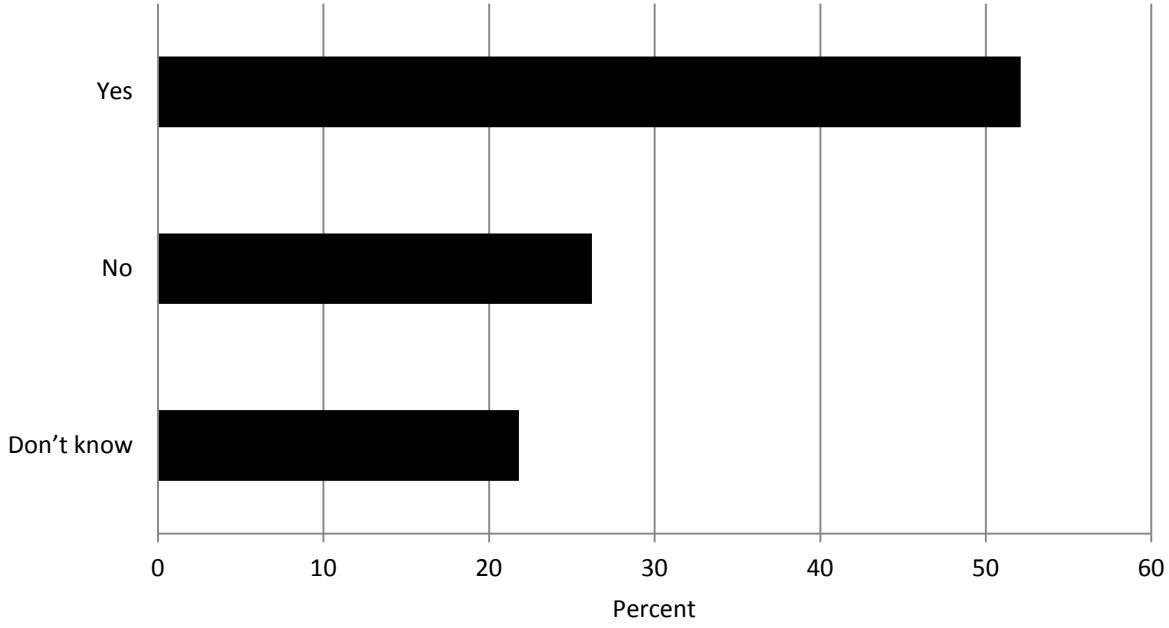
Source: 2013 New Jersey Physician HIT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 3.6: Physicians Whose EHR System is CCHIT-Certified



Source: 2013 New Jersey Physician HIT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 3.7: Physicians Who Received EHR Incentive Payment from CMS for Adoption and/or Meaningful Use of a Certified EHR

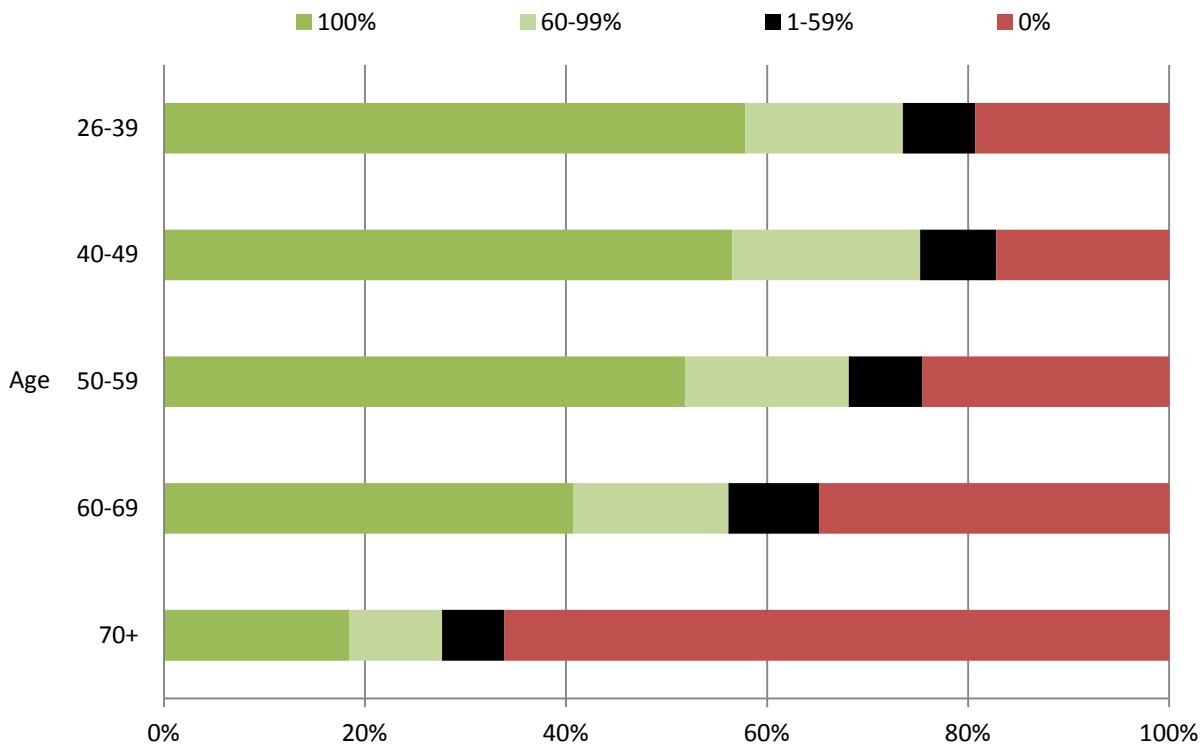


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Cross-Tabulations by Physician Age, Practice Size, and Primary Specialty Groups

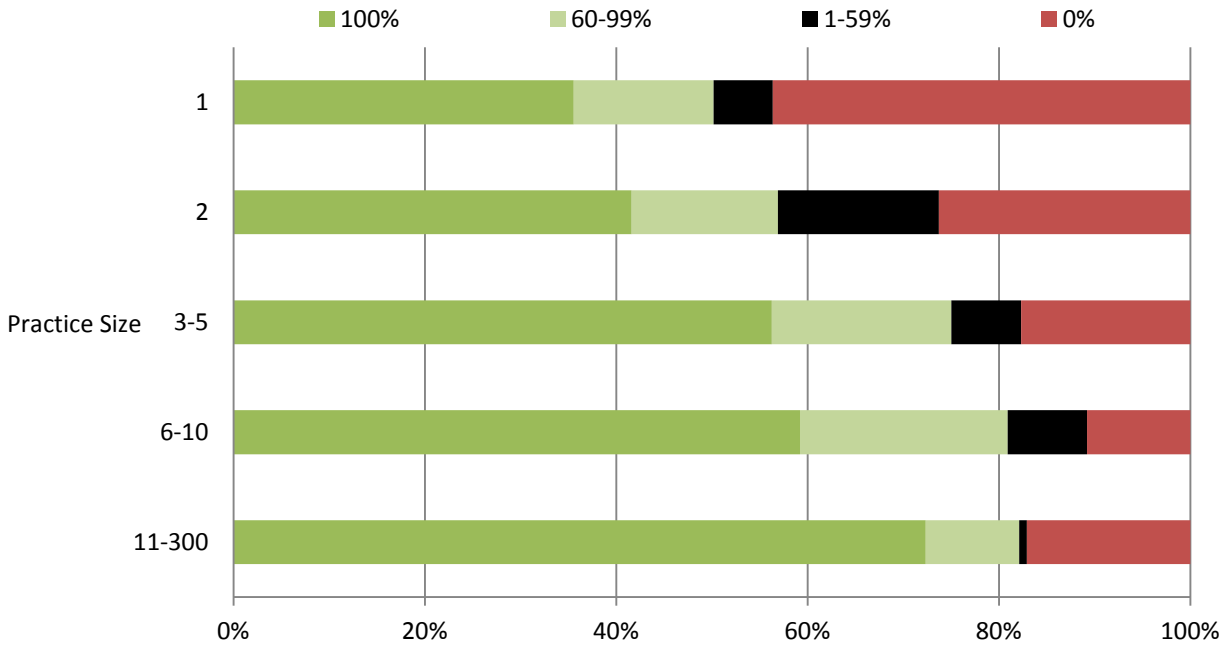
Physicians ages 69 and younger (see Figure 3.8), those in large group practices (see Figure 3.9), and primary care physicians (see Figure 3.10) were more likely to maintain 100% of their patient records on an EHR system.

Figure 3.8: Percent of Patient Records Maintained on an EHR System by Physician Age



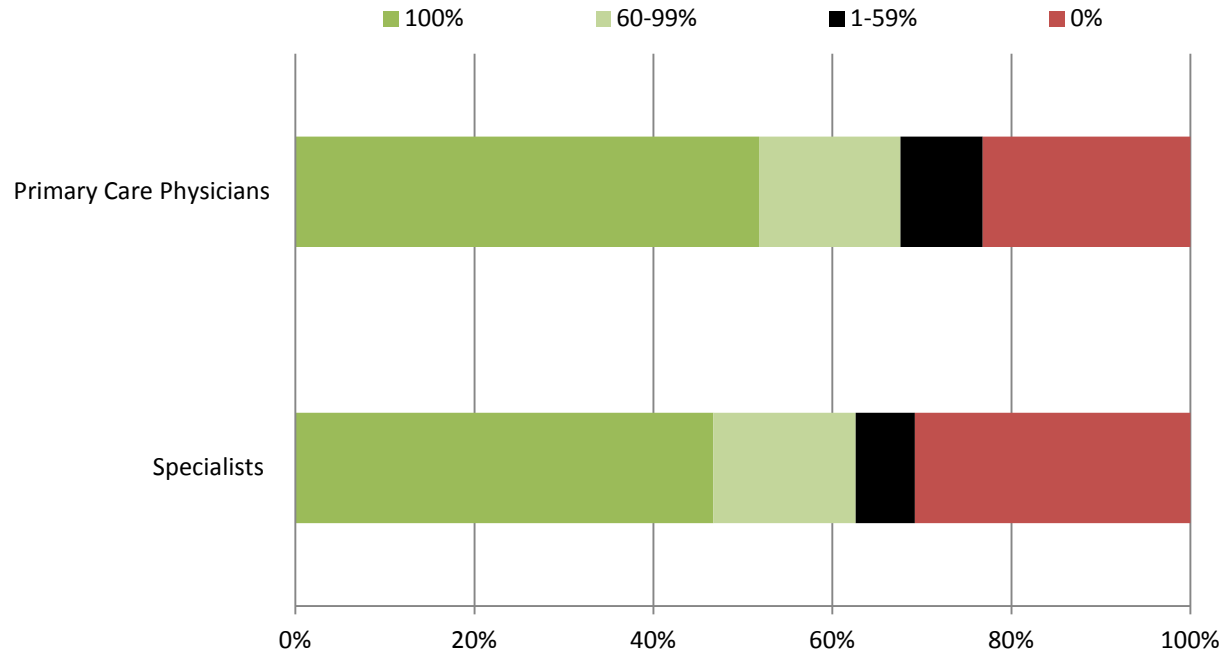
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 3.9: Percent of Patient Records Maintained on an EHR System by Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

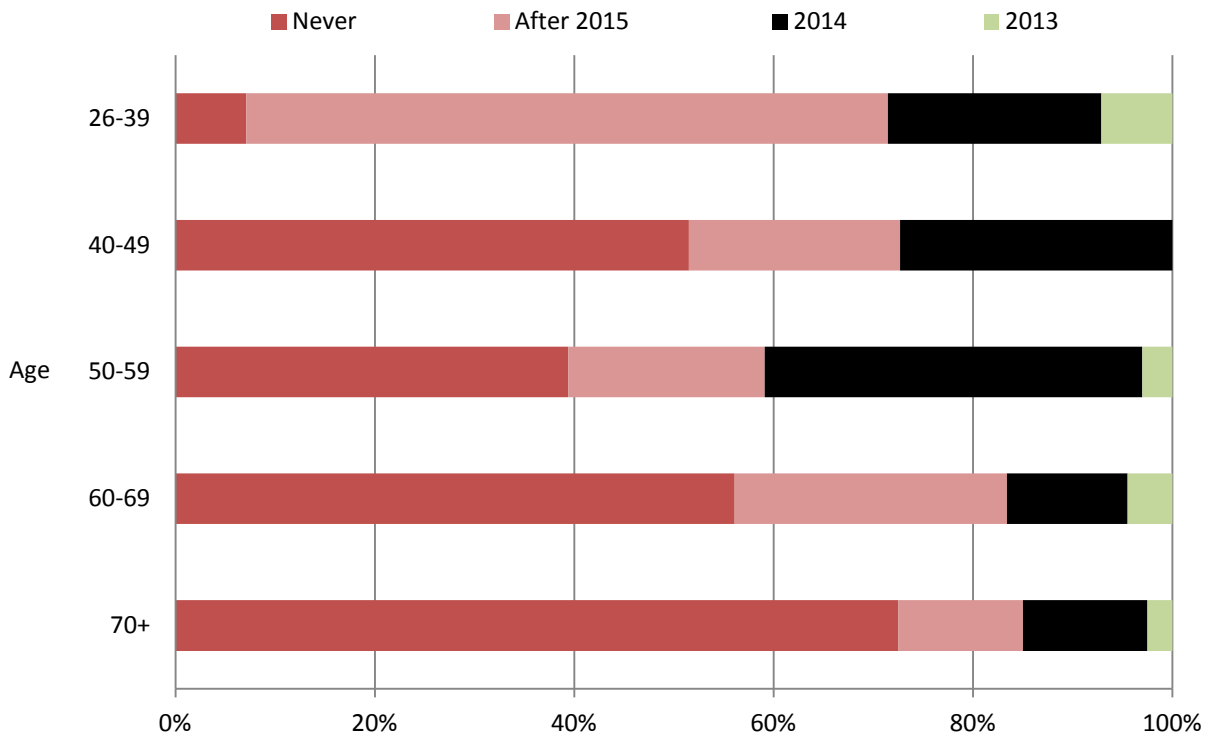
Figure 3.10: Percent of Patient Records Maintained on an EHR System by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

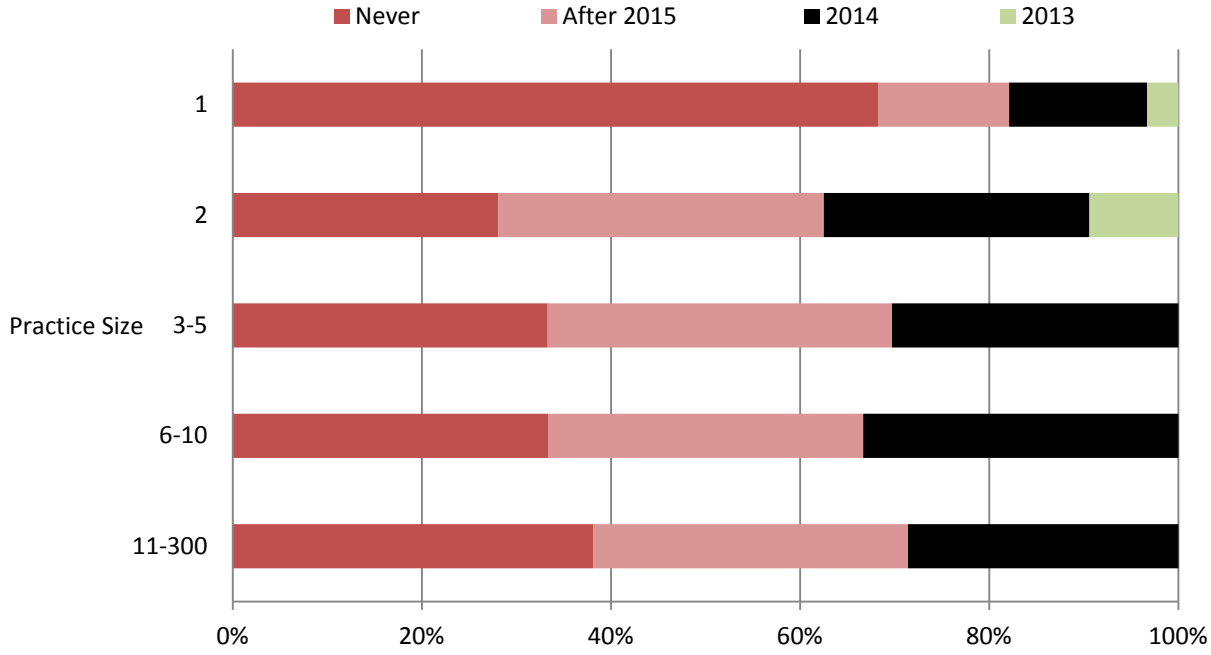
For future plans of implementation for those not using an EHR system, physicians ages 26-39 were more likely to plan to implement an EHR system after 2015 and those ages 40 and over were more likely to have no plans to implement an EHR at their practice (see Figure 3.11). As practice size increased, physicians were more likely to plan to implement an EHR system in the future (see Figure 3.12). Specialists were less likely to adopt an EHR system at their practice (see Figure 3.13).

Figure 3.11: Percent of Physicians Planning to Implement an EHR System by Physician Age



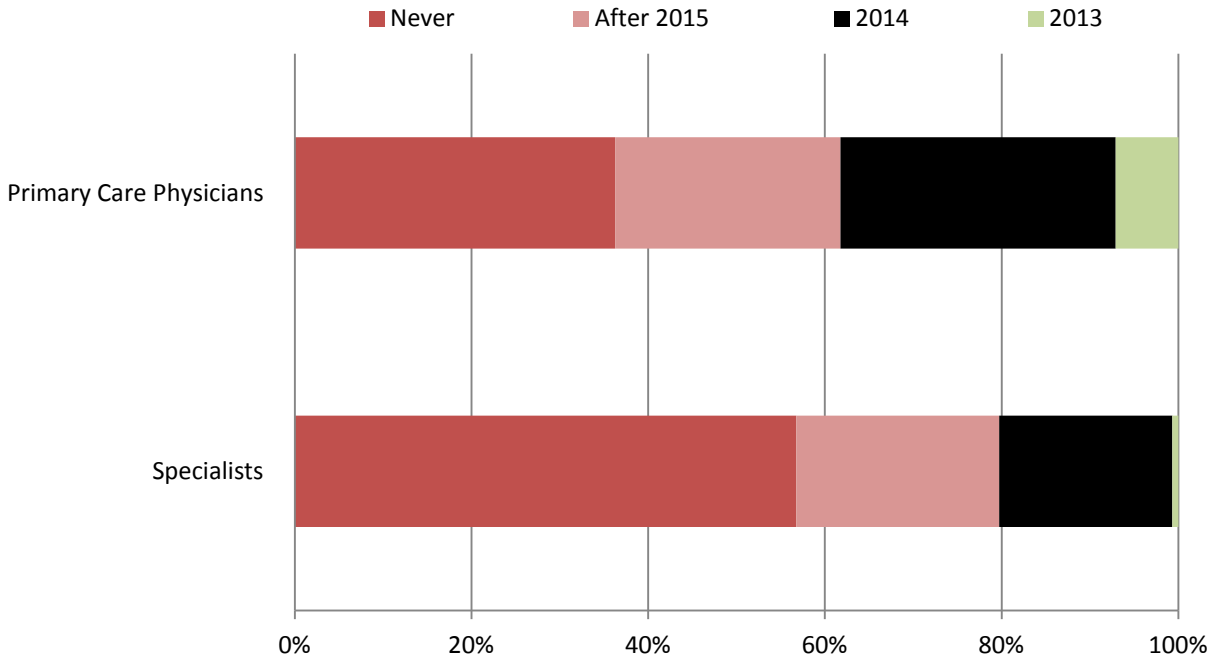
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 3.12: Percent of Physicians Who Plan to Implement an EHR System by Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 3.13: Percent of Physicians Who Plan to Implement an EHR System by Specialty



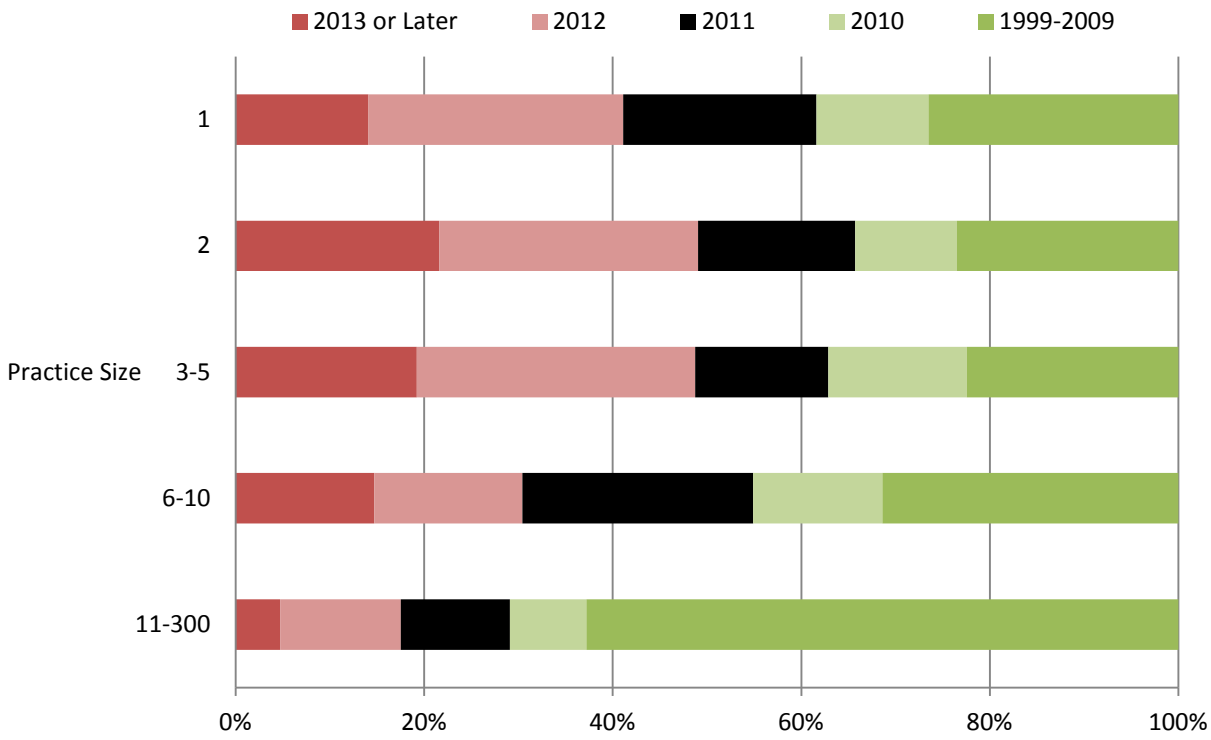
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For providing clinical visit summaries to patients, physicians in practices with 3-5 physicians and very large group practices were more likely to provide clinical visit summaries from their EHR to 100% of their patients. There were no significant differences by physician age or specialty for this measure.

For using summary of care documents for transitions of care, specialists were less likely to use summary of care documents for transitions of care for their patients. There were no significant differences by physician age or practice size for this measure.

For the year in which their practice installed the EHR system, physicians in very large practices were more likely to implement new technology earlier (see Figure 3.14). There were no significant differences by physician age or specialty for this measure.

Figure 3.14: Year Practice Installed Its EHR System by Practice Size

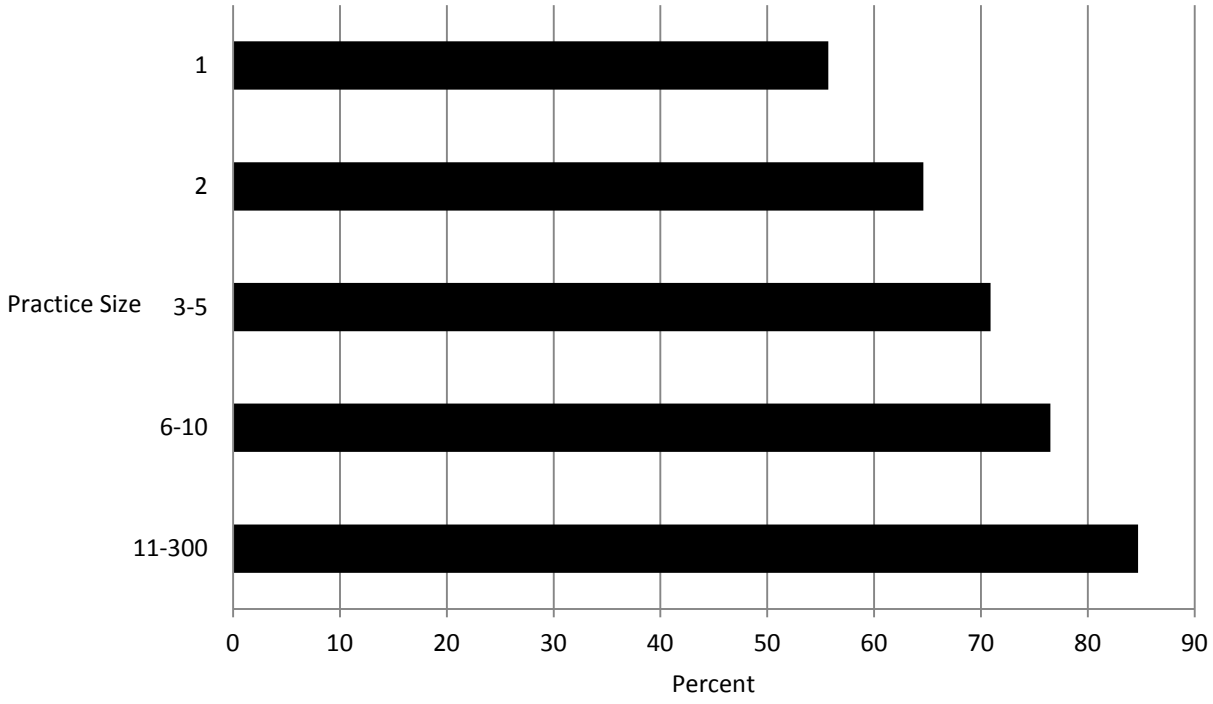


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For using a CCHIT-certified EHR system, there were no significant differences by physician age, practice size, or specialty.

Physicians in larger practices were more likely to receive an incentive payment from CMS for the adoption and/or meaningful use of a certified EHR (see Figure 3.15). There were no significant differences by physician age or specialty for this measure.

Figure 3.15: Physicians Who Received Either a Medicare or Medicaid EHR Incentive Payment by Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Conclusions

Nearly half (48.9%) of NJ physicians are currently maintaining 100% of patient records in their EHR system. Among those using an EHR system, about six in 10 (56.7%) provided a clinical visit summary from their main practice EHR to at least 50% of their patients. About four in 10 (43.2%) used a summary of care document for transitions of care for at least 50% of their patients.

A large majority of physicians (69.0%) implemented their EHR system after 2009. A little more than half (52.4%) currently use a CCHIT-certified EHR system, and about five in 10 (52.1%)

received an EHR incentive payment from CMS for adoption and/or meaningful use of a certified EHR. Among those not currently using the system, more than half (51.5%) have no plans to gain this capability in the future.

Physicians in larger group practices were more likely to maintain 100% of their patient records on an EHR system, provide a clinical visit summary from their EHR to 100% of their patients, implement new technology in an earlier phase, and receive an incentive payment from CMS for the adoption and/or meaningful use of a certified EHR.

Physicians ages 69 and younger were more likely to maintain 100% of their patient records on an EHR system. Specialists were less likely to use a summary of care document for transitions of care for their patients as compared to primary care physicians.

Among those not currently using an EHR, as practice size increased, physicians were more likely to plan to implement an EHR system in the future. Specialists were less likely to adopt an EHR system at their practice, and physicians ages 40 and over were more likely to have no plans to implement an EHR at their practice.

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Hsiao CJ, and E Hing. 2014. *Use and Characteristics of Electronic Health Record Systems among Office-Based Physician Practices: United States, 2001–2013.* NCHS Data Brief, no. 143. Hyattsville, MD: National Center for Health Statistics. http://www.cdc.gov/nchs/data/databriefs/db143.htm.

King J, V Patel, EW Jamoom, and MF Furukawa. 2014. "Clinical Benefits of Electronic Health Record Use: National Findings." *Health Services Research* 49 (1 Pt 2): 392–404.

Table 3.1: Item Frequencies, Section E: Physician Use of Electronic Health Records (EHRs)

	N	%
Total	**958**	**100.0**
% of patient records at main practice maintained on an EHR system		
0%	252	27.6
1-49%	50	5.3
50-99%	165	18.2
100%	446	48.9
Plans to implement EHR system in near future		
In 2014	58	25.6
2015 or later	52	22.9
No plans to implement	116	51.5
Among those with at least some patient records maintained on an EHR system…		
% of patients provided a clinical visit summary from main practice EHR		
0%	203	30.3
1-49%	86	12.4
50-99%	168	25.1
100%	212	31.6
% of patients for whom a summary of care document is used for transitions of care		
0%	274	43.8
1-49%	82	13.2
50-99%	120	19.2
100%	150	24.0
EHR system vendor used at main practice *(includes only those with >2% using)*		
eClinicalWorks	64	9.3
Practice Fusion	50	7.2
Allscripts	45	6.5
GE Healthcare	45	6.5
NextGen	28	4.0
Cerner	24	2.5
Vitera	22	2.3
Other	417	60.0
When EHR system first implemented at main practice		
1999-2009	199	31.0
2010	77	12.1
2011	115	17.9
2012	153	23.9
2013	97	15.1

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 3.1: Item Frequencies, Section E: Physician Use of Electronic Health Records (EHRs)

(continued)

	N	%
% whose EHR system is CCHIT-certified		
Yes	441	52.4
No	13	1.5
Don't know/refused	388	46.1
% received EHR Incentive Payment from CMS for adoption and/or meaningful use of a certified EHR		
Yes	390	52.1
No	196	26.2
Don't know	163	21.8

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Chapter 4: Physician Participation in NJ's Regional HIOs: An Analysis of the Physician HIO Participation Follow-up Survey, the 2013 Physician Survey, and HIO Use Metrics

Introduction

A Health Information Organization (HIO) facilitates electronic sharing of health data among providers. These HIOs allow data to be gathered confidentially and securely from the patient's providers, and then shared confidentially and securely among physicians and hospitals within the HIO's region for the benefit of the patient. There are six regional HIOs in New Jersey: Camden Coalition (connects Camden area providers), Health-e-cITi-NJ (connects greater Newark area providers), Jersey Health Connect (connects northern and central New Jersey healthcare providers), NJSHINE (connects southern New Jersey healthcare providers), Trenton HIE (connects Trenton area providers), and Virtua (an integrated delivery network based in southern New Jersey). Based on the NJ State HIT Operational Plan (June 2012), these HIOs will share information with each other through The New Jersey Health Information Network (NJHIN). NJHIN, once fully established, will facilitate data exchange among all HIOs operating in the State, allow the HIOs to access state data sources such as Medicaid and immunization registry information, and provide a gateway to connect to other states via the Nationwide Health Information Network (NwHIN).

The purpose of this survey is to understand physician's attitudes and preferences towards participation in HIOs and identify determinants that motivate them to exchange information through an HIO for their clinical work.

Methods

The 2013 Physician Survey is described above in Chapter 1. This chapter also contains frequencies of the two survey items from the 2013 physician survey related to HIO participation: physician awareness of an HIO and participation in one or more of NJ's six regional HIOs. Cross-tabulations were analyzed by key physician and practice characteristics (physician age, practice size, primary specialty groups).

For the physician follow-up phone/fax survey of HIO participants and non-participants, random samples of physicians participating in NJ's regional HIOs (proportionate samples were drawn based on physician primary specialty) and not participating but aware of HIOs (proportionate samples were drawn based on practice size) were drawn from respondents to the physician survey. CSHP designed semi-structured questionnaires (Appendix D) for the two samples after initial consultation with representatives from NJ's six regional HIOs, feedback from the NJ Health IT Coordinator's Office, and a literature review of similar studies. The phone interview with fax follow-up was conducted from February 1, 2014, to March 15, 2014. An advance letter on State letterhead signed by the NJ Health IT Coordinator explaining the nature of the study was mailed to the physicians. The physicians were called to schedule a time for the phone interview but, due to their busy schedules, they preferred completing the faxed questionnaire. Topics such as usefulness of information received through an HIO, satisfaction with HIO participation, benefits of HIO participation, barriers to beginning or continued HIO participation, and future plans for HIO participation (for non-users) were included in the questionnaires. Table 4A contains the number of surveys completed for each group. The overall response rate for the survey was 25.0% for the HIO participant group and 22.5% for the HIO non-participant group.

Table 4A: Status of Response for Physicians Participating and Not Participating in an HIO

	Sample Size Drawn from the 2013 Physician Survey	Number of Physicians Completing the Questionnaire
Number of physicians participating in an HIO	40	10
Number of physicians not participating but aware of an HIO in their area	40	9

For the HIO participation and non-participation questionnaires, only general impressions of the findings are included in the report due to the small number of responses in each group. Caution should be used when interpreting these findings.

The NJ HIO Use Metrics for each month of 2013 were sent by five of NJ's six regional HIOs to the NJ Department of Health who provided them to CSHP for trend analysis.

Part A: 2013 Physician Survey

Findings

Table 4B contains frequencies of physician awareness of an HIO in their area and the services they provide. Physician participation in one or more of NJ's six regional HIO is shown in Table 4C.

Table 4B: Physician Awareness of an HIO and Participation

Physician Awareness of an HIO	N	Valid%
Yes	115	12.5
No	804	87.5

Overall, only 12.5% were aware of an HIO in their area and the services they provide. Among those aware (N=115), 64 physicians were not participating in any HIO. The cross-tabulations for awareness of HIO in their area by key physician and practice characteristics (physician age, practice size, primary specialty groups) were not statistically significant ($p<0.05$).

Table 4C: Physician Participation in One or More Regional HIOs

	N	Valid%
Total number of physicians participating in HIOs	63	6.8
Camden Coalition	3	0.4
Health-e-cITi-NJ	9	0.9
Jersey Health Connect	18	1.9
NJSHINE	6	0.6
Trenton HIE	1	0.1
Virtua	32	3.3
None	897	93.6

For HIO participation, 6.8% of physicians were participating in one or more regional HIOs. The participation was largest for Virtua (32 physicians) and smallest for Trenton HIE (1 physician). The cross-tabulations for physician participation in HIOs by key physician and practice characteristics (physician age, practice size, primary specialty groups) are not conducted due to the small sample size.

Part B: 2014 Survey of Physicians Participating in an HIO

Ratings of Individual Checklist Topics

Physicians were asked to rate the: (1) usefulness of information they are receiving through an HIO; (2) effect of electronic sharing of information via an HIO on the efficiency and quality of patient care; (3) barriers to current or continued participation in an HIO; (4) satisfaction with participation; and (5) ease of accessing information and integrating it into their workflow.

Open-Ended Questions

The open-ended question section included the following topics: (1) other services or information they would like to get from an HIO in the future; (2) factors that determined their decision to participate; (3) concerns about privacy and security of sharing information through an HIO; (4) concerns about participation in an HIO either now or in the future; (5) future situations that might lead them to stop participating; (6) their practice plans to sustain HIO participation in the future; (7) advice for other providers who are currently not participating; (8) role of the State in encouraging physician participation; and (9) patients' feelings about their physicians' participation in an HIO.

Findings

The majority of physicians who responded to the survey were aware of how data is shared through an HIO but were unaware of how they are funded. Information about an HIO was received more often from hospitals and EHR system vendors or other IT companies. Some other sources of information were directly from an HIO, news/media, and other physicians. Many physicians reported a “moderate” level of understanding for how HIO data exchange works.

Overall (see Table 4.2), the most frequent responses for the type of information received from an HIO were reports, laboratory results, and radiology results. Physicians also frequently received clinical summaries, hospital discharge summary, and information on all medications prescribed from an HIO. For the items used to assess the usefulness of the information from an HIO on their practice, across most items, most physicians felt that it was either very useful or somewhat useful to them. Almost everyone reported not accessing an HIO for reasons other than for accessing patient information. One physician said that they were able to get some graphical reports using an HIO.

The majority of physicians were somewhat satisfied with sharing health information with their HIOs and also other providers. For the ease of accessing information from an HIO, the most frequently cited response was somewhat/very easy. However, for ease of integrating

information from an HIO into their workflow, the most frequent response was "somewhat difficult." One physician said that it depends on from where you are accessing the data (home/office). For accessing patient information from an HIO, more physicians are accessing it before seeing the patient and during the visit and less after the visit.

For the items used to assess the impact of electronic sharing of information via an HIO on their practice, across most measures, most physicians felt that it would have a very or somewhat positive impact. However, some physicians felt that it would have a somewhat negative impact on productivity and healthcare costs. One physician commented that sharing with other practices was not available.

For barriers to current or continued participation in an HIO (see Table 4.3), training time (productivity loss) was the leading minor or major barrier cited by the physicians. This was followed by computer technical support, lack of uniform standards within the industry, support from vendors for upgrading or maintaining the HIO system, and low participation by area physicians and other providers. The financial return on investment was most frequently cited as not a barrier by the physicians.

Open-Ended Questions

Frequencies of responses to the open-ended questions were ranked in order from most to least frequent. Figures 4.1 through 4.6 present these ranked frequencies.

Other Services/Information from an HIO

Overall, the most frequent response for other services or information that physicians would like to get from an HIO was for lab reports (see Figure 4.1). The second most requested information was for cardiology reports.

Figure 4.1: What Other Services or Information Would You Like to Get from an HIO?

Response	Number of Mentions
Lab reports (including downloading lab reports into EHR)	4
Cardiology (including ECHO, Stress test, CATH)	2
PATH report	1
Outpatient testing order management	1
Guidelines for testing with ability to reconcile guideline recommendations with orders and results	1
Physician connectivity in a secure way	1
Operative reports	1
Lab results available to patients	1
Quality metrics	1
PSG (polysomnography)	1
Advance directives/ Physician Orders for Life-Sustaining Treatment (POLST)	1
Record sharing with other HIOs	1

Decision/Concerns to Join an HIO

Overall (see Figure 4.2), the most frequently cited reason for joining an HIO was either easier access of patient information or physicians joined as part of their practice. This was followed by cost of participation, and to be competitive in the market as other physicians were participating. Some concerns raised were for repetition of information in an EHR, and privacy of data.

Figure 4.2: What Factors Determined the Decision to Participate and What Were the Concerns?

Response	Number of Mentions
Easier access of information	3
No decision making process. Joined as part of the health systems	3
Cost	2
Other participators (to be competitive)	2
Relevance of information available	1
Better patient care	1
Decision to join is a no-brainer	1
Concern raised for large volume of EHR (repetition of information)	1
Privacy related concerns	1

Reasons for Satisfaction/Dissatisfaction with Participation in an HIO

The most frequently cited reason (see Figure 4.3) for dissatisfaction was the incapability of the infrastructure to provide easier access to patient information. However, some physicians were satisfied because of availability of patient information from an HIO. Some physicians felt that satisfaction would improve if all providers were linked, and HIO and EHR were integrated.

Figure 4.3: Why Are You Satisfied/Dissatisfied with Your Participation in an HIO?

Response	Number of Mentions
Infrastructure not up to speed (takes too long to access the information)	3
Availability of information	2
Will be better if all providers are linked	1
Will be better if there is integration with an EHR	1
Not all pertinent information received	1
Don’t need this often	1

Most Important Reason for Joining an HIO

The most cited reason (see Figure 4.4 below) for joining an HIO was continuity of care. This was followed by completeness and accuracy of patient's health record, efficiency with which clinical care is delivered in their practice, quality of care, patient safety, and care coordination.

Figure 4.4: What Is the Most Important Reason You Joined an HIO?	
Response	**Number of Mentions**
Continuity of care	5
Completeness and accuracy of patient's health record	4
Efficiency with which clinical care is delivered in your practice	4
Quality of care	4
Patient safety	4
Care coordination	4
Auto enrolled	4
Communication with other providers	3
Productivity	3
Patient satisfaction	2
Healthcare costs	1
To help demonstrate “meaningful use” so as to receive federal incentive	1

Privacy and Security of Sharing Patient Information and Concerns about HIO Participation

The majority of physicians said they were not concerned about the privacy and security of sharing patient information through an HIO. However, some physicians raised concerns about the accidental or purposeful breach of the privacy. For concerns about HIO participation either now or in the future, the most frequent response was that they had no concerns. One physician said the benefits of participation outweigh risks. For future situations that might lead them to stop participating in an HIO, most responders did have concerns. Reasons mentioned were cost for participation; issues with data security, privacy, and reliability; and retirement or relocation.

Sustainability Plans

Among those who responded to this question (see Figure 4.5), the more commonly cited responses for sustaining their participation were continued participation as part of their practice and building it into the standard workflow of their practice.

Figure 4.5: How Does Your Practice Plan to Sustain HIO Participation in the Future?	
Response	**Number of Mentions**
Continue to participate as part of my practice	2
Build into standard workflow (necessary part of practice)	2
Follow updates by Hospital IT	1
Impossible to answer as rules keep changing	1
No plans	1

Advice to Other Providers Not Participating

Most physicians did not discuss their reasons to participate in an HIO with other providers not currently participating in an HIO. For advice to other providers, a few mentioned the benefits of participation were better patient care and safety. One physician said that it has to be an individual choice as it may be difficult for small practices to afford.

Support from the NJ Health IT Coordinator's Office

The more commonly cited support needed from the State was for standardization of the system, communication with physicians about the benefits of participation in an HIO, and making HIOs fully operational (see Figure 4.5).

Figure 4.6: What Can the State of New Jersey Do to Encourage More Physician Participation in HIOs?	
Response	**Number of Mentions**
Standardize the system	2
Communicate benefits	2
Fully operational HIOs (facilitate merging into 1 HIO)	2
Keep cost down	1
Pay cost of participation	1
Assure that full time practicing physicians are involved in the development	1
Integrate EHR and HIO	1
Protect physicians from legal challenges if system breaks	1

Patients' Perceptions about Their Physician's Participation in an HIO

Most physicians said that their patients were not aware of their participation. However, some shared positive feedback from their patients.

Part C: 2014 Survey of Physicians Not Participating In but Aware of HIOs

Ratings of Individual Checklist Topics

Physicians were asked to rate the: (1) level of understanding of how HIO data exchange works; (2) perceptions about the effect of electronic sharing of information via an HIO on the efficiency and quality of patient care; (3) interest in joining a New Jersey Regional HIO; (4) future plans to start participating; (5) ease of using new health IT such as an EHR; and (6) barriers to beginning participation in an HIO.

Open-Ended Questions

The open-ended question section included the following topics: (1) factors that determined their decision to not participate; (3) biggest reason for not participating in an HIO; (4) patients' feelings about their physician's non-participation in an HIO; (5) role of the State in encouraging physician participation; and (6) future situations that might lead them to start participating.

Findings

The majority of physicians who responded to the survey were aware of how data is shared through an HIO but were unaware of how they are funded. Information about an HIO was received more often from the NJ Regional Extension Center (NJ-HITEC) and news/media. Some other sources of information were from an EHR system vendor or other IT companies. The level of understanding of physicians for how HIO data exchange works varied from "none" to "moderate" level.

Most physicians said that they were not aware of an HIO in their area (see Table 4.4). Almost everyone shared an interest in joining an HIO. One physician shared an interest in understanding the pros and cons of joining an HIO. For future plans to start participating, some physicians plan to start participating in 2014. One physician said they would join as soon as the process is clarified. For the ease of using new health IT such as an EHR, the most frequently cited response was somewhat/very easy.

For the items used to assess the perception of impact of electronic sharing of information via an HIO on their practice, across most measures, most physicians felt that it would have a very or somewhat positive impact. However, some physicians felt that it would negatively impact productivity. Some additional factors shared by the physicians that would impact electronic sharing of information via an HIO were staff time, steep learning curve, and difficulty in coordinating vendors for data sharing. One physician shared skepticism about its effect on health care costs.

For barriers to beginning participation in an HIO (see Table 4.5), most measures were cited as a minor or a major barrier by the physicians. Ongoing financial costs, personnel and /or time to select and implement the HIO system, and training time (productivity loss) were the leading minor or major barriers cited by the physicians. These were followed by start-up costs, the financial return on investment, obtaining and updating patient consent, and lack of time to acquire knowledge about HIO systems. One physician said that he/she feels that his/her primary job is to implement and utilize new technology.

Open-Ended Questions

Frequencies of responses to the open-ended questions were ranked in order from most to least frequent. Figures 4.7 through 4.9 present these ranked frequencies.

Decision/Concerns to Not Join an HIO

Overall (see Figure 4.7), the most frequently cited reason was the lack of an opportunity to participate. Some concerns were raised about the complicated and decentralized process as an HIO is not integrated with an EHR.

Figure 4.7: What Factors Determined the Decision to Not Participate and What Were the Concerns?	
Response	**Number of Mentions**
Never given opportunity to participate	2
Requirements of MU2 will make it easier	1
Availability	1
Never considered in the short-term	1
Complicated and decentralized process (no integration of EHR and HIO)	1
Would consider	1

Most Important Reasons for Not Joining an HIO

The most commonly cited main reason for not joining an HIO was the lack of information about its existence. This was followed by cost, and complexity of set up and maintenance (see Figure 4.8). Multiple incompatible systems, rare need for lab data, and time and lack of participation by other providers were cited as the second main reason for non-participation in an HIO.

Figure 4.8: What Is the Biggest Reason You DO NOT Participate in an HIO?	
Response	**Number of Mentions**
Not aware of an HIO	3
Cost	2
Complexity of set up and maintenance	2
Not in charge of the group	1
Not readily available	1
Just joined	1

Support from the NJ Health IT Coordinator's Office

The more commonly cited support needed from the State was for standardization and facilitation of the process and making the information available to physicians. This was followed by financial and technical support incentives to reduce costs (see Figure 4.9 below).

Figure 4.9: What Can the State of New Jersey Do to Encourage Physician Participation in HIOs?	
Response	**Number of Mentions**
Standardize and facilitate the process	3
Make information available	3
Reduce cost (financial and technical support incentives)	2
Changes meaning use requirement (re: patient portal)	1
Don’t Know	1

For future situations that might lead them to start participating, ease of use, financial and technical support incentives, hospital participation, and if it is part of meaningful use criteria for Stage 2 were mentioned.

Part D: 2013 NJ HIO Use Metrics

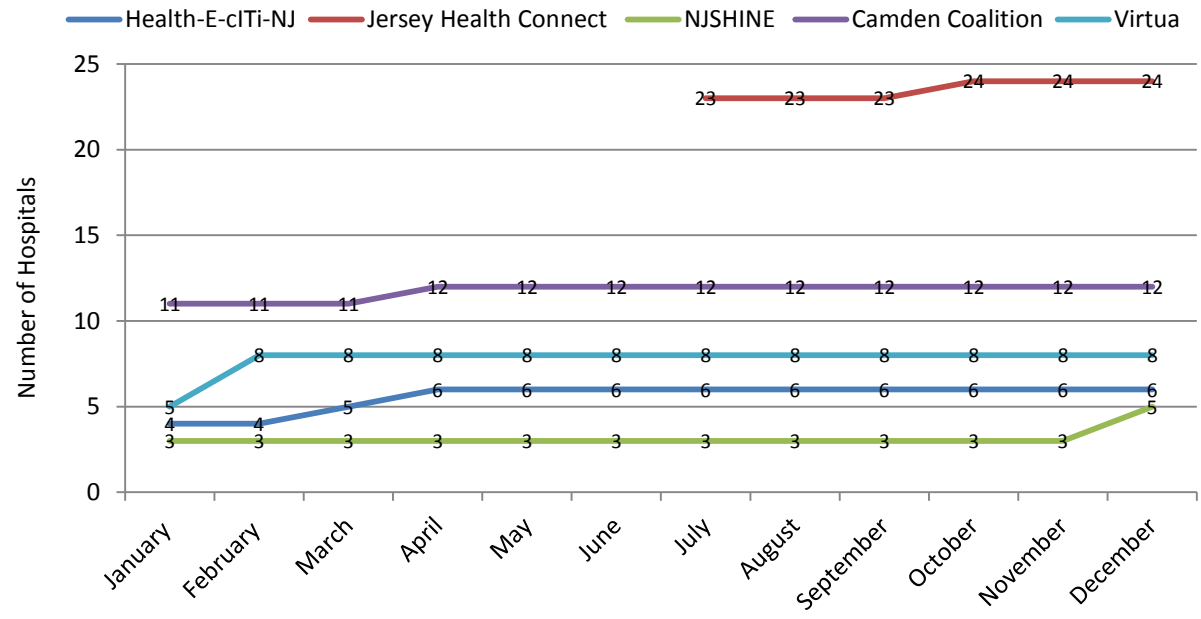
Five of NJ's six HIOs reported monthly data on (1) number of affiliated hospitals in each HIO; (2) number of physician practices in each HIO; (3) number of organizations enabled for query-based exchange; number of patient records in each HIO; (4) number of individual users enabled for query-based exchange; (5) number of acute care hospitals actively participating in query-based exchange; (6) total number of unique patient records in each HIO; (7) total number of patient record queries; (8) number of patient record queries from ambulatory entities; and (9) number of patient record queries from acute care hospitals to the NJ Health IT Coordinator's Office.

Findings

Number of Affiliated Hospitals

The number of affiliated hospitals improved for all five HIOs in early 2013 and then remained stable throughout the year (see Figure 4.10). The number of hospital affiliations was largest for Jersey Health Connect.

Figure 4.10: Number of Affiliated Hospitals by HIO, 2013

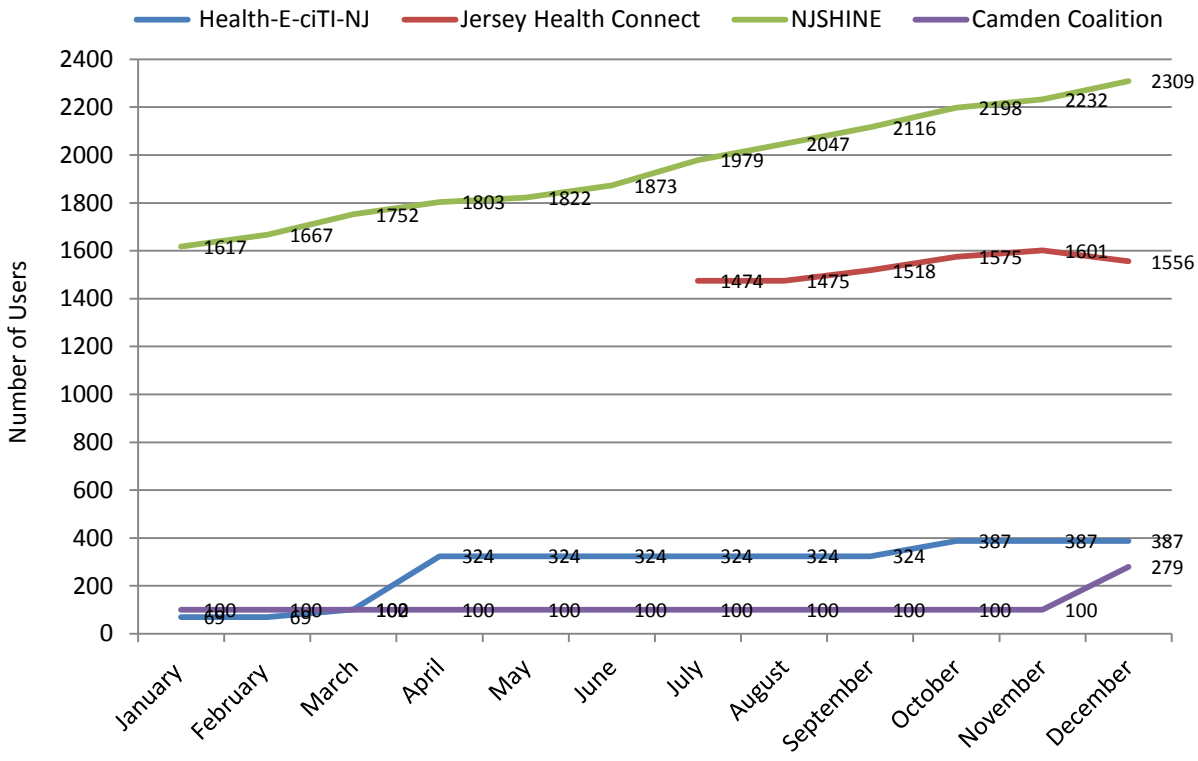


Note: Data not available for Trenton Health Team.
Source: 2013 HIO Use Metrics, New Jersey Department of Health.

Number of Individual Users Enabled for Query-Based Exchange

In 2013, the total number of individuals with access to query-based exchange improved for NJSHINE, Health-e-cITi-NJ, and Camden Coalition but decreased slightly for Jersey Health Connect (see Figure 4.11). The number of individuals with access to query-based exchange was highest for NJSHINE.

Figure 4.11: Number of Individual Users Enabled for Query-Based Exchange by HIO, 2013

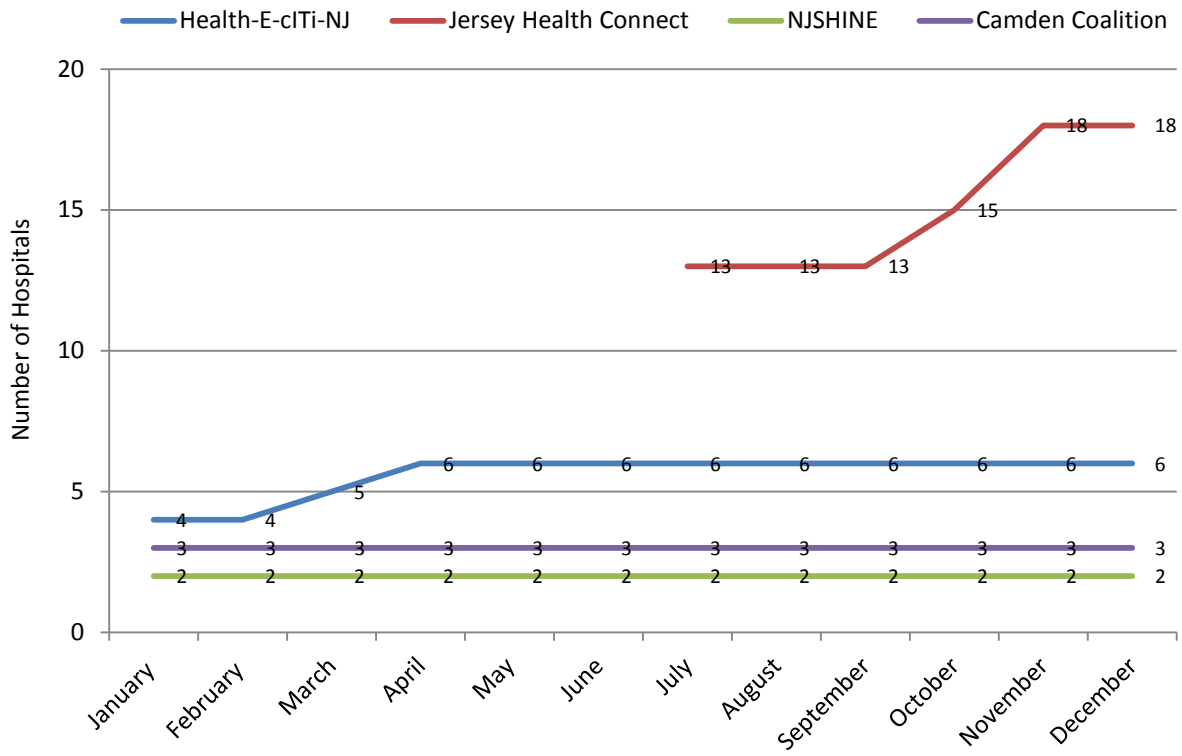


Note: Data not available for Trenton Health Team and Virtua.
Source: 2013 HIO Use Metrics, New Jersey Department of Health.

Number of Acute Care Hospitals Actively Participating in Query-Based Exchange

Total number of acute care hospitals that submitted at least one query in 2013 through an HIO improved for both Jersey Health Connect and Health-e-cITi-NJ (see Figure 4.12). The number of participating acute care hospitals was highest for Jersey Health Connect.

Figure 4.12: Number of Acute Care Hospitals Participating in Query-Based Exchange by HIO, 2013

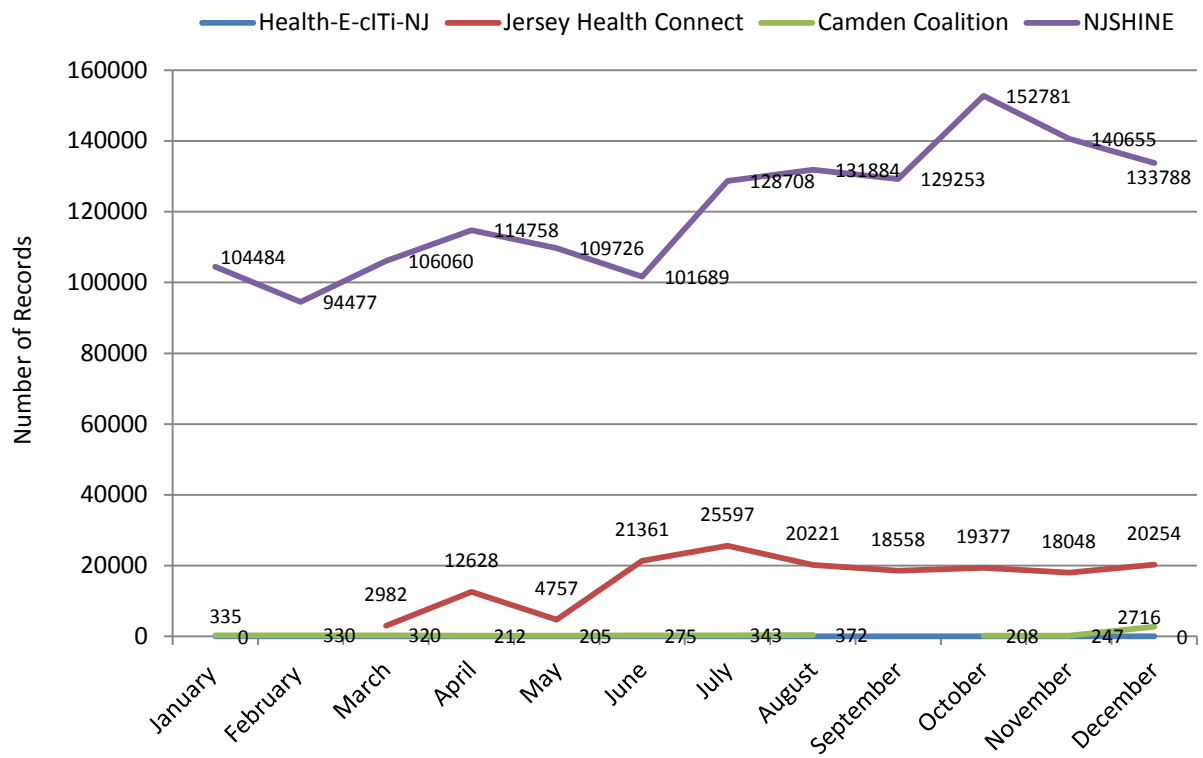


Note: Data not available for Trenton Health Team and Virtua.
Source: 2013 HIO Use Metrics, New Jersey Department of Health.

Number of Patient Record Queries from Ambulatory Entities

The total number of patient record queries submitted from ambulatory entities was highest for NJSHINE (ranging from 104,484 in January, 2013, to 133,788 in December, 2013) and lowest for Health-e-cITi-NJ (0 queries submitted in 2013) (see Figure 4.13).

Figure 4.13: Number of Patient Record Queries from Ambulatory Entities by HIO, 2013



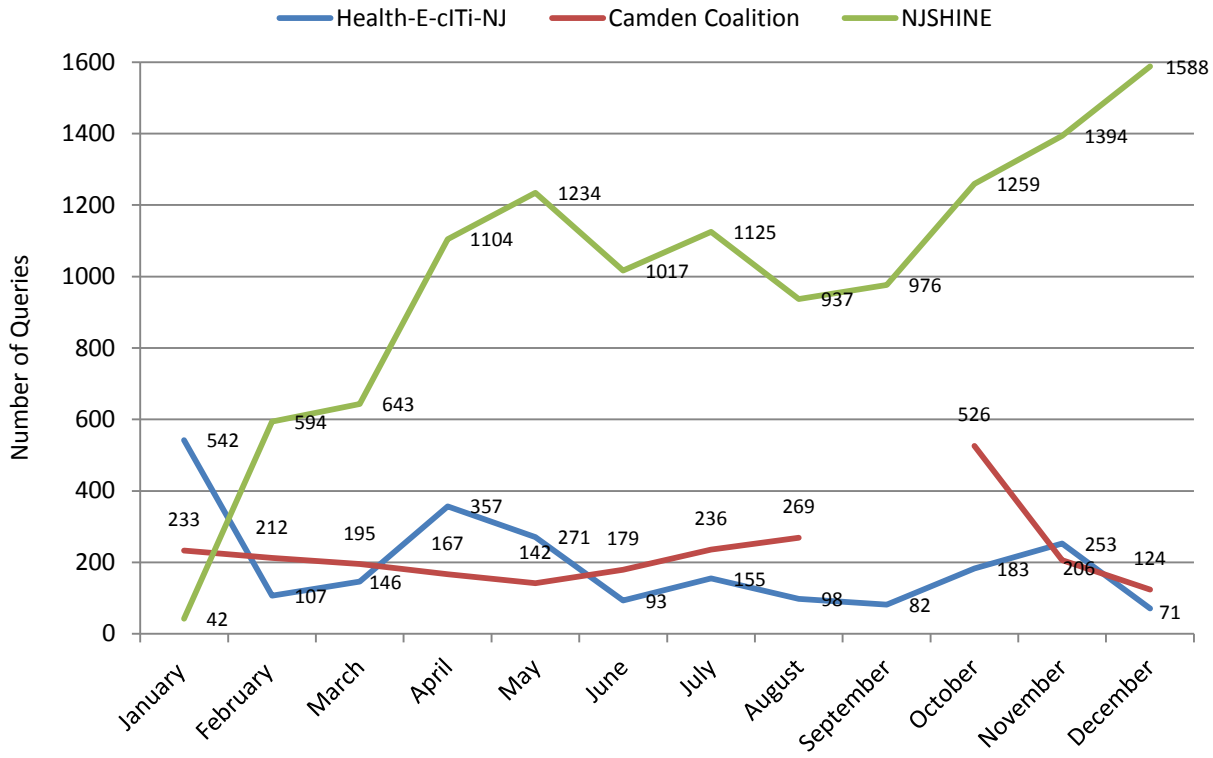
Note: Data not available for Trenton Health Team and Virtua.

Source: 2013 HIO Use Metrics, New Jersey Department of Health.

Number of Patient Record Queries from Acute Care Hospitals

In 2013, the number of patient record queries submitted from acute care hospitals improved for NJSHINE (from 42 in January to 1,588 in December). For both Camden Coalition and Health-e-cITi-NJ, the number of queries submitted decreased in December 2013 (see Figure 4.14).

Figure 4.14: Number of Patient Record Queries from Acute Care Hospitals by HIO, 2013



Note: Data not available for Jersey Health Connect, Virtua, and Trenton Health Team.
Source: 2013 HIO Use Metrics, New Jersey Department of Health.

Conclusions

A small number of physicians from the 2013 physician mail survey were aware of an HIO in their area and the services they provide and even smaller numbers were participating in one or more regional HIOs in their area. Among all six HIOs in NJ, the physician participation was highest for Virtua.

Physicians participating in an HIO reported a moderate level of understanding of how data is shared through an HIO but were unaware of how they are funded. Most physicians were receiving reports, laboratory results, and radiology results and felt that they were either very useful or somewhat useful to them. The majority of physicians were somewhat satisfied with

sharing health information with their HIOs and also other providers, found accessing information somewhat/very easy, but felt that integrating information from an HIO into their workflow is somewhat difficult. Most physicians felt a very or somewhat positive impact of electronic sharing of information via an HIO on their practice. However, some physicians felt that it would have a somewhat negative impact on productivity and healthcare costs. For barriers to current or continued participation in an HIO, training time (productivity loss) was the leading barrier followed by computer technical support, lack of uniform standards within the industry, support from vendors for upgrading or maintaining the HIO system, and low participation by area physicians and other providers.

The most frequent responses for other services or information that physicians would like to get from an HIO were for lab reports and cardiology reports. Physicians said that they joined an HIO for continuity of care, easier access of patient information, or as part of their practice. The most frequently cited reason for dissatisfaction was the incapability of the infrastructure to provide easier access to patient information. Some physicians felt that satisfaction would improve if all providers were linked, and HIO and EHR were integrated. However, some physicians raised concerns about the accidental or purposeful breach of privacy. The more commonly cited support needed from the State was for standardization of the system, communication with physicians about the benefits of participation in an HIO, and making HIOs fully operational.

Among physicians not participating in an HIO, the majority were aware of how data are shared through an HIO but were unaware of how they are funded. The level of understanding of physicians for how HIO data exchange works varied from “none” to “moderate” level. Most physicians said that they were not aware of an HIO in their area and shared an interest in joining an HIO. Some physicians plan to start participating in 2014. Most physicians felt that the impact of electronic sharing of information via an HIO would have a very or somewhat positive impact on their practice. However, some physicians felt that it would negatively impact productivity. Some additional factors shared were staff time, steep learning curve, and difficulty in coordinating vendors for data sharing. For barriers to beginning participation in an HIO, ongoing financial costs, personnel and /or time to select and implement the HIO system, and training time (productivity loss) were the leading barriers followed by start-up costs, the financial return on investment, obtaining and updating patient consent, and lack of time to acquire knowledge about HIO systems.

The most frequently cited reason for not participating was the lack of an opportunity to participate. This was followed by cost, complexity of set up and maintenance, multiple incompatible systems, rare need for lab data, and time and lack of participation. The more commonly cited support needed from the State was for standardization and facilitation of the

process and making the information available to physicians. This was followed by financial and technical support incentives to reduce costs. Physicians shared that these incentives might help them to start participating.

The number of affiliated hospitals increased for all five HIOs that provided data in 2013. The total number of individuals with access to query-based exchange improved for NJSHINE, Health-e-cITi-NJ, and Camden Coalition. The number of acute care hospitals participating in query-based exchange increased for both Jersey Health Connect and Health-e-cITi-NJ. The total number of patient record queries submitted from ambulatory entities as well as acute care hospitals was highest for NJSHINE.

Table 4.1: Item Frequencies, Section D: Physician Awareness/Participation in HIOs

	N	%
Total	**958**	**100.0**
Physicians aware of an HIO in their area and the services provided	**115**	**12.5**
Physician participation in NJ's six HIOs		
Camden Coalition	3	0.4
Health-e-cITi-NJ	9	0.9
Jersey Health Connect	18	1.9
NJSHINE	6	0.6
Trenton HIE	1	0.1
Virtua	32	3.3
None	897	93.6

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 4.2: Item Frequencies, Information Received Through an HIO and Usefulness of Information

(N = 10)

	HIO Participants
	Number of Mentions
Information received through an HIO	
Physician notes	3
Clincal summaries	7
Reports	8
Laboratory results	8
Radiology results (without images)	8
Radiology images	4
Cardiology results	5
EKG images	5
Problem list with diagnosis code	3
All medication prescribed	6
All medications filled	1
Allergy information	5
Hospital discharge summary	6
Advance directives	2
Satisfaction from sharing information with HIO and other providers	
Very satisfied	0
Somewhat satisfied	7
Somewhat dissatisfied	1
Very dissatisfied	0
Ease of accessing information	
Very easy	2
Somewhat easy	4
Somewhat difficult	3
Very difficult	0
Ease on integrating information from an HIO in to workflow	
Very easy	2
Somewhat easy	2
Somewhat difficult	5
Very difficult	0

Source: 2014 New Jersey Physician HIO Participation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 4.3: Item Frequencies, Barriers to Current or Continued Participation in an HIO

(N = 10)

	HIO Participants
	Number of Mentions
Start-up financial costs	
Not a barrier	4
Minor barrier	2
Major barrier	1
Ongoing financial costs	
Not a barrier	3
Minor barrier	2
Major barrier	2
The financial return on investment or ROI	
Not a barrier	5
Minor barrier	1
Major barrier	1
Personnel and/or time to select and implement the HIO system	
Not a barrier	2
Minor barrier	3
Major barrier	2
Support from vendors for upgrading/maintaining the HIO system	
Not a barrier	1
Minor barrier	3
Major barrier	3
Training time, productivity loss	
Not a barrier	0
Minor barrier	5
Major barrier	3
Attitudes of you (or other physicians in your practice) about using Health IT	
Not a barrier	4
Minor barrier	2
Major barrier	1

Source: 2014 New Jersey Physician HIO Participation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 4.3: Item Frequencies, Barriers to Current or Continued Participation in an HIO

(continued)(N = 10)

	HIO Participants
	Number of Mentions
Privacy and security concerns	
Not a barrier	2
Minor barrier	5
Major barrier	0
Obtaining and updating patient consent	
Not a barrier	2
Minor barrier	5
Major barrier	1
Computer skills of you/staff	
Not a barrier	3
Minor barrier	4
Major barrier	1
Computer technical support	
Not a barrier	1
Minor barrier	5
Major barrier	2
Lack of time to acquire knowledge about HIO systems	
Not a barrier	3
Minor barrier	2
Major barrier	2
Lack of uniform standards within the industry (multiple systems)	
Not a barrier	0
Minor barrier	1
Major barrier	6
Low participation by area physicians and other providers	
Not a barrier	1
Minor barrier	4
Major barrier	2

Source: 2014 New Jersey Physician HIO Participation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 4.4: Item Frequencies, Awareness and Interest in Participation in an HIO

(N = 9)

	HIO Non-Participants
	Number of Mentions
Awareness of an HIO in the area	
Yes	3
No	6
Interest in joining a New Jersey Regional HIO	
Very interested	4
Moderately interested	2
A little interested	2
Not all all interested	1
Plans to start participating	
2014	3
2015	1
2016	0
After 2016	0
Undecided	1
Ease of use of new health information technology	
Very easy	4
Somewhat easy	2
Somewhat difficult	1
Very difficult	0

Source: 2014 New Jersey Physician HIO Participation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 4.5: Item Frequencies, Barriers to Beginning Participation in an HIO

(N = 9)

	HIO Non-Participants
	Number of Mentions
Start-up financial costs	
Not a barrier	1
Minor barrier	3
Major barrier	4
Ongoing financial costs	
Not a barrier	0
Minor barrier	4
Major barrier	4
The financial return on investment or ROI	
Not a barrier	1
Minor barrier	2
Major barrier	5
Personnel and/or time to select and implement the HIO system	
Not a barrier	0
Minor barrier	3
Major barrier	5
Support from vendors for upgrading/maintaining the HIO system	
Not a barrier	2
Minor barrier	4
Major barrier	2
Training time, productivity loss	
Not a barrier	0
Minor barrier	4
Major barrier	4
Attitudes of you (or other physicians in your practice) about using Health IT	
Not a barrier	3
Minor barrier	3
Major barrier	2

Source: 2014 New Jersey Physician HIO Participation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Table 4.5: Item Frequencies, Barriers to Beginning Participation in an HIO (continued)(N = 9)

	HIO Non-Participants
	Number of Mentions
Privacy and security concerns	
Not a barrier	2
Minor barrier	5
Major barrier	1
Obtaining and updating patient consent	
Not a barrier	1
Minor barrier	6
Major barrier	1
Computer skills of you/staff	
Not a barrier	2
Minor barrier	6
Major barrier	0
Computer technical support	
Not a barrier	3
Minor barrier	3
Major barrier	2
Lack of time to acquire knowledge about HIO systems	
Not a barrier	1
Minor barrier	5
Major barrier	2
Lack of uniform standards within the industry (multiple systems)	
Not a barrier	1
Minor barrier	2
Major barrier	4
Low participation by area physicians and other providers	
Not a barrier	1
Minor barrier	3
Major barrier	3

Source: 2014 New Jersey Physician HIO Participation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

Chapter 5: Physician Use of Electronic Clinical Summaries: An Analysis of the Physician Clinical Summary Follow-up Survey and the 2013 Physician Survey

Introduction

This chapter covers physician use of electronic summaries. Data sources include the 2014 follow-up phone/fax survey of physicians who use and do not use electronic clinical summaries (see Part A) and relevant items from the 2013 Physician Mail Survey (see Part B).

Part A: Physician Phone/Fax Survey

To better understand physicians' experience with clinical summaries (also known as electronic patient care summaries), CSHP conducted a telephone survey with fax follow-up of New Jersey physicians who either used or did not use clinical summaries as indicated on the 2013 Physician Health IT Survey. A sample of physicians was drawn based on the response to the following questions: (1) For what percentage of your patients do you provide a clinical visit summary from your EHR? and (2) Do you provide electronic patient care summaries to other providers? The 2013 Physician Health IT Survey is described in Chapter 1. For the phone interview, physicians were asked about benefits to using clinical summaries, barriers and drawbacks to using clinical summaries, history of implementation and future plans for implementation, if any.

Methods

The semi-structured electronic clinical summary phone interview was designed by CSHP with feedback from the NJ Health IT Coordinator's Office and representatives of NJ-HITEC and NJ's regional HIOs. The phone survey with fax follow-up was conducted from January 31, 2014, to March 25, 2014. Survey topics included awareness of meaningful use criteria, methods used to provide clinical summaries to patients, workflow adjustments, content of electronic clinical summaries, method of exchange with other providers, benefits to the use of clinical summaries, barriers to using clinical summaries, and future plans for implementing or maintaining clinical summaries.

Two samples were drawn from respondents to the physician survey of both clinical summary users and non-users. The user sample included physicians that provided clinical summaries to 50% or more of their patients and also exchanged clinical summaries with other physicians. The non-user sample included physicians that provided clinical summaries to 0-9% of their patients and did not exchange clinical summaries with other physicians. An advance letter on State letterhead, signed by the NJ Health IT Coordinator, was mailed to 147 physicians to explain the nature of the interview and request participation. Physicians were offered the option to complete the survey by phone or fax to encourage participation in the survey.

Table 5.1 contains the number of interviews completed. The overall response rate for the survey was 21.4%.

Table 5.1: Status of Clinical Summary Response

Status	
Completed	30
No response	117
Total	147

Due to the small number of responses, only general impressions of the findings are included in this report. Caution should be used when interpreting these findings.

Findings

Users of Clinical Summaries

The semi-structured interview included questions about history of clinical summary use, computer skills, awareness of meaningful use criteria, workflow adjustments, decision factors in the design of clinical summaries, exchange with other providers, compatibility, benefits to the use of clinical summaries, future plans for the use of clinical summaries, advice for other providers, and sources of information regarding clinical summaries that informed implementation (see Appendix E for a copy of the survey questionnaire).

All physicians reported that they were either somewhat or very adept at using clinical summaries. The majority of physicians were somewhat or very aware of the Stage 1 and Stage 2 meaningful use criteria. In general, all physicians provide the clinical summary to the patient during the visit. The most frequent reasons that a patient may not be provided with a clinical summary were technical issues, one-time visit, language barrier, practice does not push for clinical summaries, and patient refusal. The majority of physicians reported that workflow adjustments were necessary to implement clinical summaries. The majority of physicians reported that the provider enters information during the visit. Other workflow adjustments

included gathering and entering information into the EHR before the provider sees the patient and provider reviews clinical summary with the patient. IT staff was cited most frequently as involved in the decision of what to include in the clinical summary followed by suggestions from the vendor, the clinical team in the practice, and the physician that we interviewed. The design elements most frequently considered were highlighting categories, formatting, and language. More than half of the physicians interviewed exchange clinical summaries with providers sometimes or often. Electronic system compatibility when exchanging clinical summaries with other providers was a major problem for more than half of the physicians. All the physicians plan to increase or maintain the use of clinical summaries. About half of the physicians were familiar with NJ-HITEC. Less than half were familiar with any of the 6 regional HIOs in New Jersey.

Open-Ended Questions (Users)

Responses to the open-ended questions were ranked in order from the most to least frequent.

Benefits

Overall, the most frequently cited benefit was to the patient through education, knowledge, information, or coordination of care. The second most cited benefit was verification of medication lists (see Table 5.2).

Table 5.2: What Is the Most Important/Second Most Important Benefit of Clinical Summaries?

	Number of Mentions
Benefits patient (education/knowledge/information/coordination of care)	8
Verification of accurate medication lists by patient/medication reconciliation	5
Benefits other providers (transitions of care/ease of sharing/more comprehensive patient history)	4
Allow patients to review/amend medical record	3
Concise/accurate clinical information	3
Communication	2
Patient understanding	2
Makes taking additional history easier	1
Minimize questions	1
Patients are impressed	1

Drawbacks

Overall, the most frequently cited drawback was time. The second most cited drawback was that it wastes paper (see Table 5.3).

Table 5.3: What Is the Biggest Drawback/Second Biggest Drawback to the Use of Electronic Clinical Summaries?

	Number of Mentions
Time	5
Wastes paper	3
Lack of compatibility between EMRs	2
Slowness	2
Patient complaints about ICD codes	1
Patient may present new problems while waiting for clinical summary	1
Most patients do not want or care about this	1
Repetition of information	1
Cost	1
Unable to view patient and type	1
Language barriers	1
Patient may leave before it prints and we have to mail it	1
No computer or internet means no summaries	1

Advice

A few physicians offered advice to practices who have not implemented clinical summaries. Their advice included exercising care with codes, keep it simple, have a positive attitude, strong IT support, and hire a scribe (see Table 5.4).

Table 5.4 What Advice Do You Have for Practices Who Have Not Yet Implemented Clinical Summaries?

	Number of Mentions
Be careful what codes you use to avoid offending patient	1
Keep it as simple as possible	1
Have a positive attitude	1
Strong IT support	1
Hire a scribe	1

Sources of Information Received about Clinical Summaries

The most frequent source of information about clinical summaries was the EHR vendor. The second most frequent source of information was the IT Department (see Table 5.5 below).

Table 5.5: What Sources of Information Did You Use to Inform the Implementation of Electronic Clinical Summaries in Your Practice?

	Number of Mentions
EHR vendor	6
IT department	3
Interviews	1
Seminars	1

Non-Users of Clinical Summaries

The semi-structured interview included questions about reasons the practice has not implemented clinical summaries, EHR skill level, computer skill level, considerations that affect the use of clinical summaries, plans to implement clinical summaries, familiarity with NJ-HITEC, familiarity with the 6 regional HIOs in New Jersey, and sources of information regarding clinical summaries and how to implement them (see Appendix E for a copy of the survey).

Nearly half of physicians reported high computer skills. EHR skill level ranged from low to high. The most frequent considerations regarding the patient population that affect the use of clinical summaries were that the provider was not trained in the use of clinical summaries, followed by their practice does not push for clinical summaries. Other considerations regarding the use of clinical summaries included productivity (interference with ability to see patients and software slows down physicians) and that the patient knew full details. Nearly half of the physicians plan to implement the use of clinical summaries in the future, with several planning to do so within the next two years. Less than half of the physicians were familiar with NJ-HITEC or any of the six regional HIOs in New Jersey.

Open-Ended Questions (Non-Users)

Responses to the open-ended questions were ranked in order from the most to least frequent.

Reason Clinical Summaries Not Implemented

Overall, the most frequently cited reason that clinical summaries were not implemented was cost. The second most frequently cited reason was that it wastes time or takes too much time (see Table 5.6).

Table 5.6: What Is the Main Reason/Next Most Important Reason That Your Practice Has Not Implemented Electronic Clinical Summaries Extracted from an EHR?

	Number of Mentions
Cost	5
Wastes time/too much time	3
Not a priority	1
Reluctance by other people	1
Not much need to provide summary to patients yet	1
Not aware of availability	1
Time commitment to learn	1
Unreliability of present symptoms	1
Plan retirement soon	1
Nature of practice does not support the use	1
Patients often misinterpret medical jargon	1
EHRs are time consuming and have limited clinical value	1
EHR's do not seem to cover pediatric problems	1

Sources of Information Received about Clinical Summaries

Overall, the most frequently cited source of information was none. The second most frequently cited source of information was EHR vendor (see Table 5.7).

Table 5.7: What Sources of Information Have You Received or Reviewed Regarding Electronic Clinical Summaries and How to Implement Them in Your Practice?

	Number of Mentions
None	6
EHR vendor	3

Conclusions

Physicians who use clinical summaries indicated benefits to patients, improved accuracy of clinical information, and benefits to other providers. The most frequently cited workflow adjustments necessary to implement clinical summaries for the majority of physicians was entering information during the appointment. Drawbacks to the use of clinical summaries were time and paper waste. More than half of physicians exchanged clinical summaries with other providers, and electronic system compatibility was a major concern. Physicians were most likely to receive information about clinical summaries from an EHR vendor or IT Department.

For physicians who do not use clinical summaries, cost and time were the main reasons for not implementing clinical summaries in their practices. Few physicians reported receiving information from any source about implementing clinical summaries. For non-users of clinical

summaries, there was a range of EHR skill level with some physicians indicating that EHRs have limited clinical value or that the nature of their practice does not support the use of EHRs (e.g., psychiatry or pediatric practices). Nearly half of physicians plan to implement clinical summaries in the future.

Part B: 2013 Physician Survey

Methods

See Chapter 1 for a description of the physician survey. Topics relevant to clinical summaries included exchange of electronic patient care summaries with other providers, percent of patients that are provided with a clinical visit summary, impact of electronic patient care summaries, and barriers to implementing or expanding the use of exchanging electronic patient care summaries.

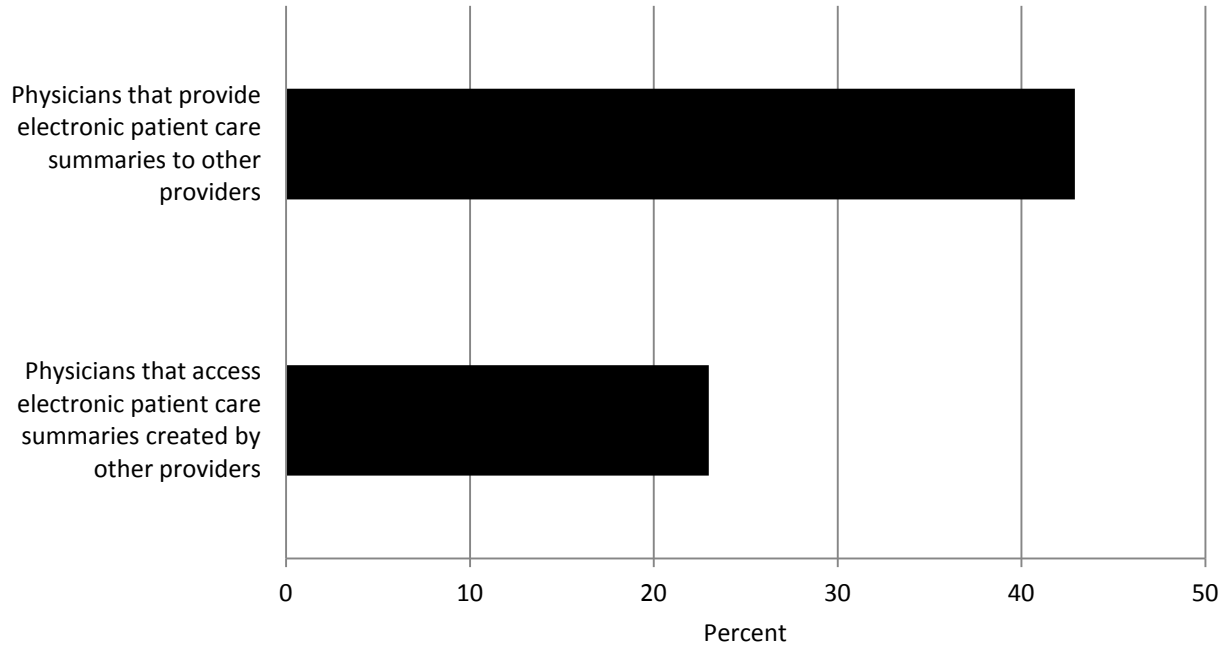
Findings

Physician Use of Electronic Patient Care Summaries

Table 5.8 and Figures 5.1-5.3 contain the weighted frequencies for the electronic patient care summary items contained in Section C of the physician survey. Less than half (42.9%) of physicians provided electronic patient care summaries to other providers (see Figure 5.1). About one-quarter (23.0%) accessed electronic patient care summaries created by other providers (see Figure 5.1). Over half (57.3%) of physicians provided a clinical visit summary to at least 50% of their patients.

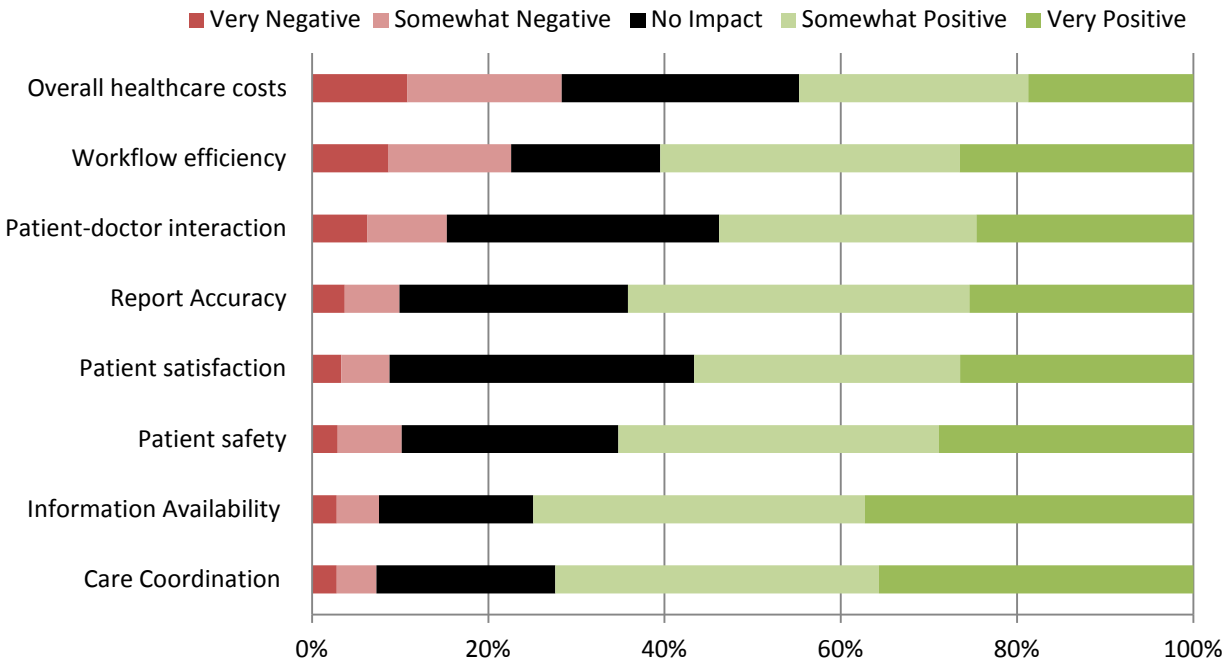
For items used to assess the impact of electronic patient care summaries (see Figure 5.2), across most measures, the majority of physicians felt that electronic patient care summaries would have a positive impact (range across the measures: 53.8% to 74.9%). This was especially true for information availability (74.9% reported a positive impact), and care coordination (72.4%). The exception was the impact on overall healthcare costs, where only 44.7% thought electronic patient care summaries would have a positive impact.

Figure 5.1: Physicians Who Provide/Access Electronic Patient Care Summaries



Source: 2013-2014 New Jersey Clinical Laboratory Health IT Evaluation Survey; data collection and tabulations by Rutgers Center for State Health Policy.

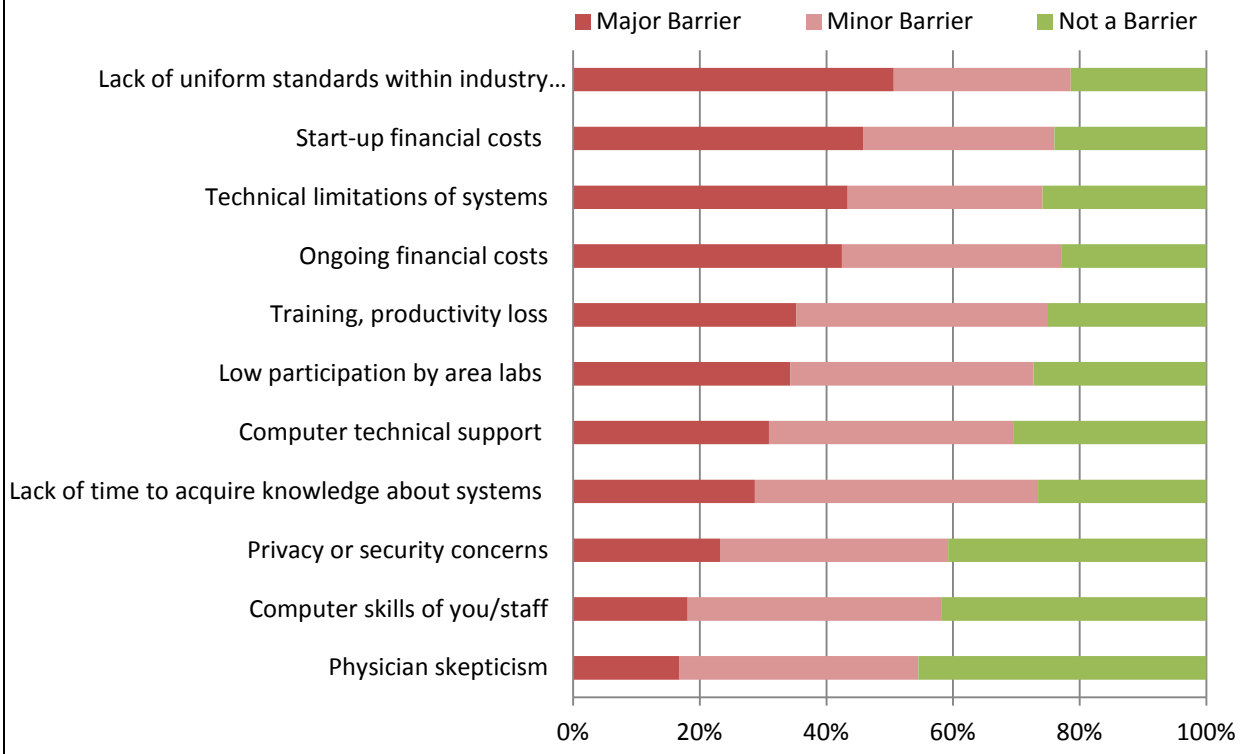
Figure 5.2: Physicians - Impact of Electronic Patient Care Summaries



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For barriers to implementing or expanding the use of electronic patient care summaries (see Figure 5.3), lack of uniform standards within the industry was the top barrier cited, with 50.6% saying it was a major barrier and another 27.9% saying it was a minor barrier. This was closely followed by ongoing financial costs (major barrier 42.4%, minor barrier 34.6%), technical limitations of systems (major barrier 39.0%, minor barrier 37.7%), and start-up financial costs (major barrier 45.8%, minor barrier 30.2%). Physician skepticism and computer skills were rarely cited as major barriers.

Figure 5.3: Physicians - Barriers to Implementing or Expanding Use of Electronic Patient Care Summaries

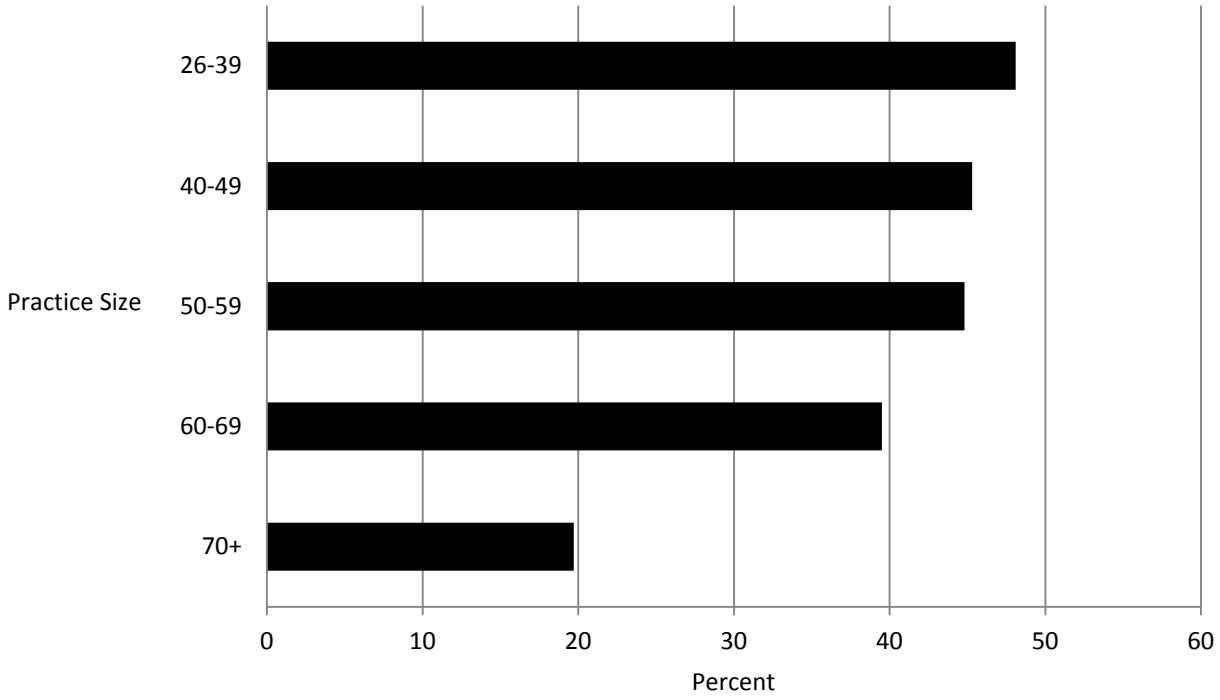


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Cross-Tabulations by Physician Age, Practice Size, and Primary Specialty Groups

Physicians ages 70 and over were less likely to provide electronic patient care summaries to other providers. As practice size increased, physicians were more likely to provide electronic patient care summaries to other providers (see Figure 5.4). There was no significant difference by specialty for this measure.

Figure 5.4: Physicians Who Provide Electronic Patient Care Summaries to Other Providers by Practice Size

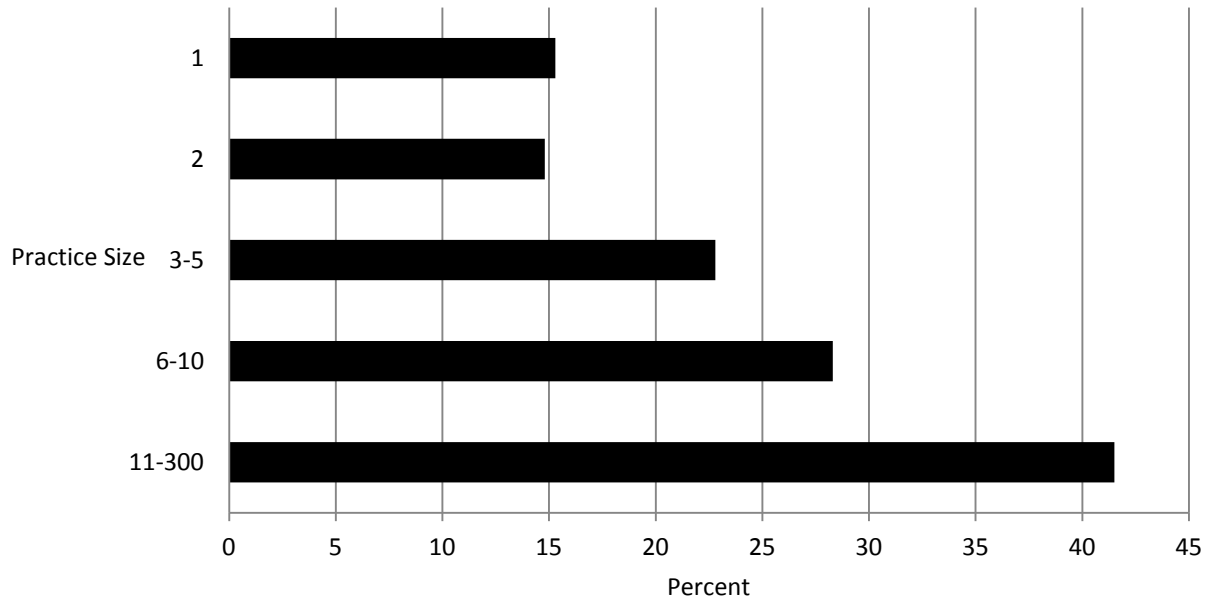


Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

For accessing electronic patient care summaries created by other providers, as practice size increased (especially for very large practices), physicians were more likely to access electronic patient care summaries created by other providers (see Figure 5.5). There were no significant differences by physician age or specialty for this measure.

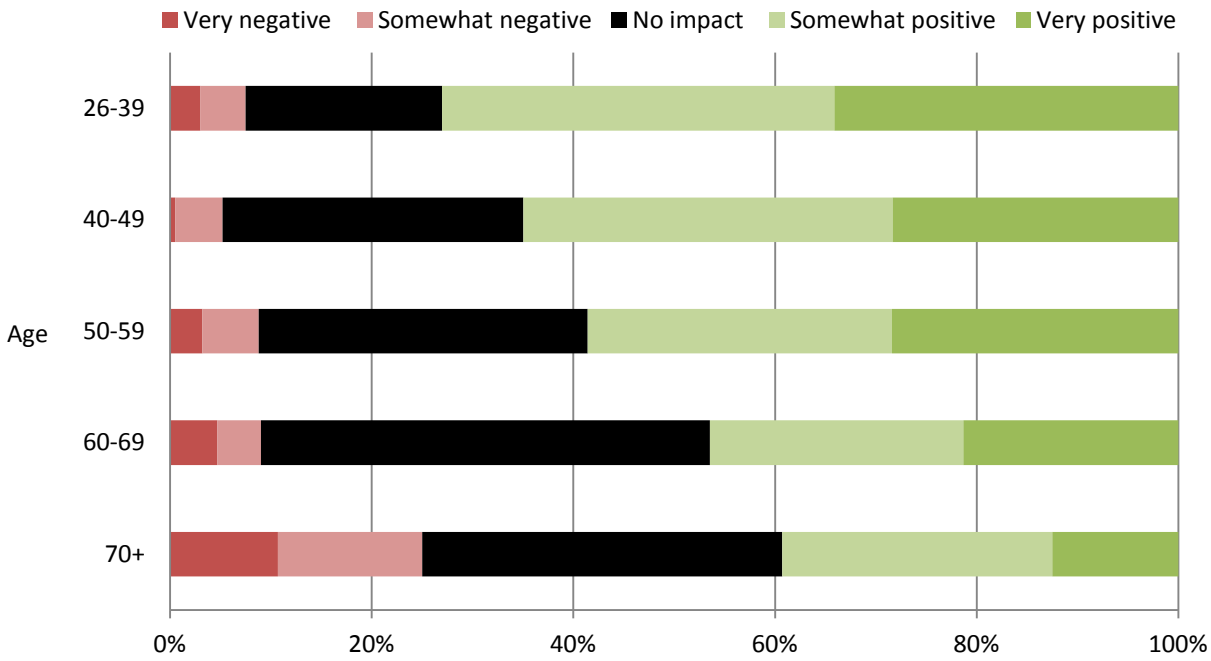
For the items used to assess the impact of electronic patient care summaries on their practice, as age increased, physicians were less likely to report a positive effect of electronic patient care summaries on their practice for all the items (see Figure 5.6). With increase in practice size, physicians were more likely to report a positive effect of electronic patient care summaries on their practice for all the items (see Figure 5.7). Primary care physicians were more likely to report a positive impact on healthcare costs and patient satisfaction (see Figure 5.8).

Figure 5.5: Percent of Physicians Who Access Electronic Patient Care Summaries from Other Providers by Physician Practice Size



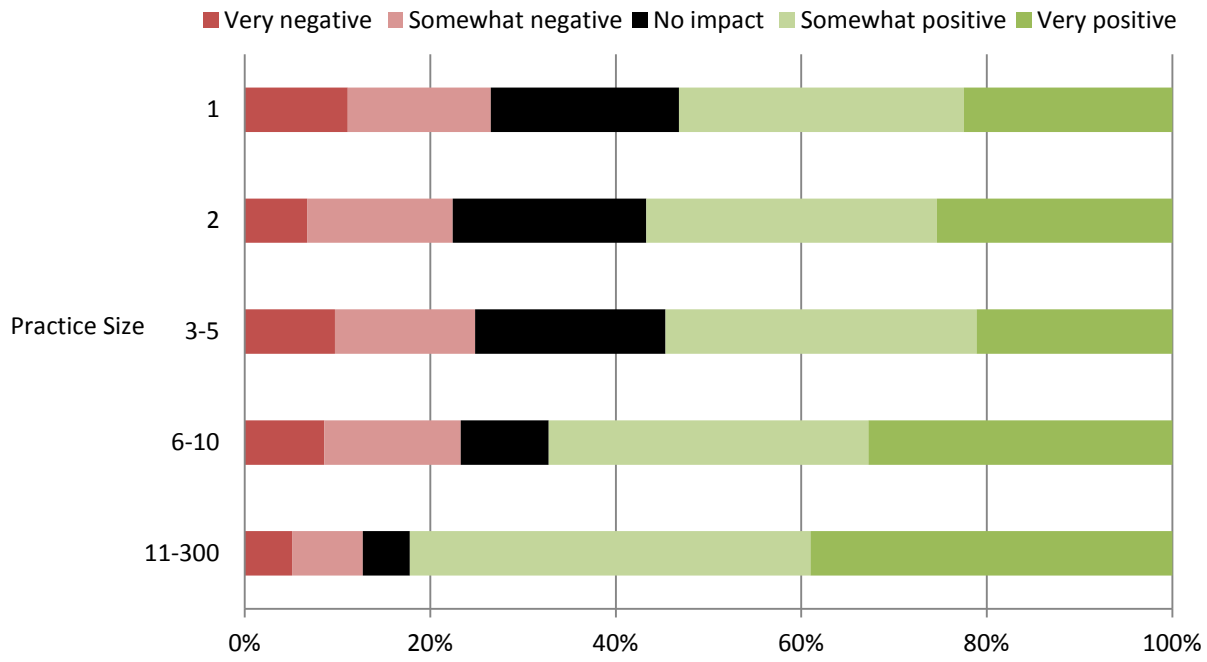
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 5.6: Effect of Electronic Patient Care Summaries on Patient Satisfaction by Physician Age



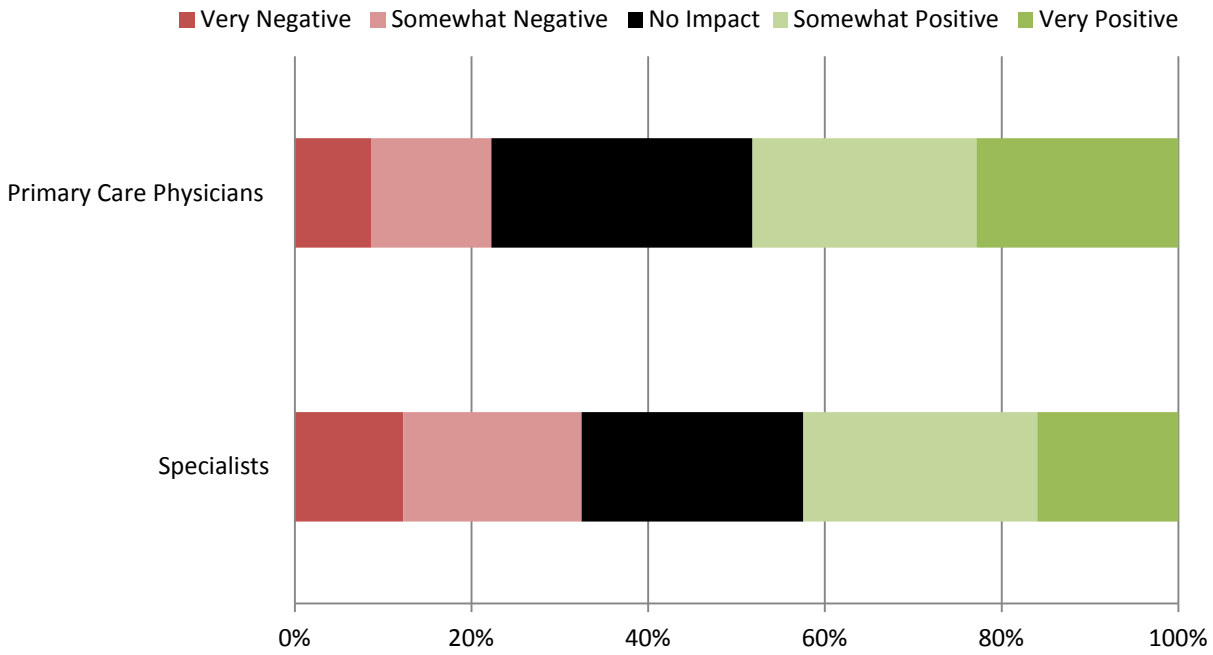
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 5.7: Effect of Electronic Patient Care Summaries on Workflow Efficiency by Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

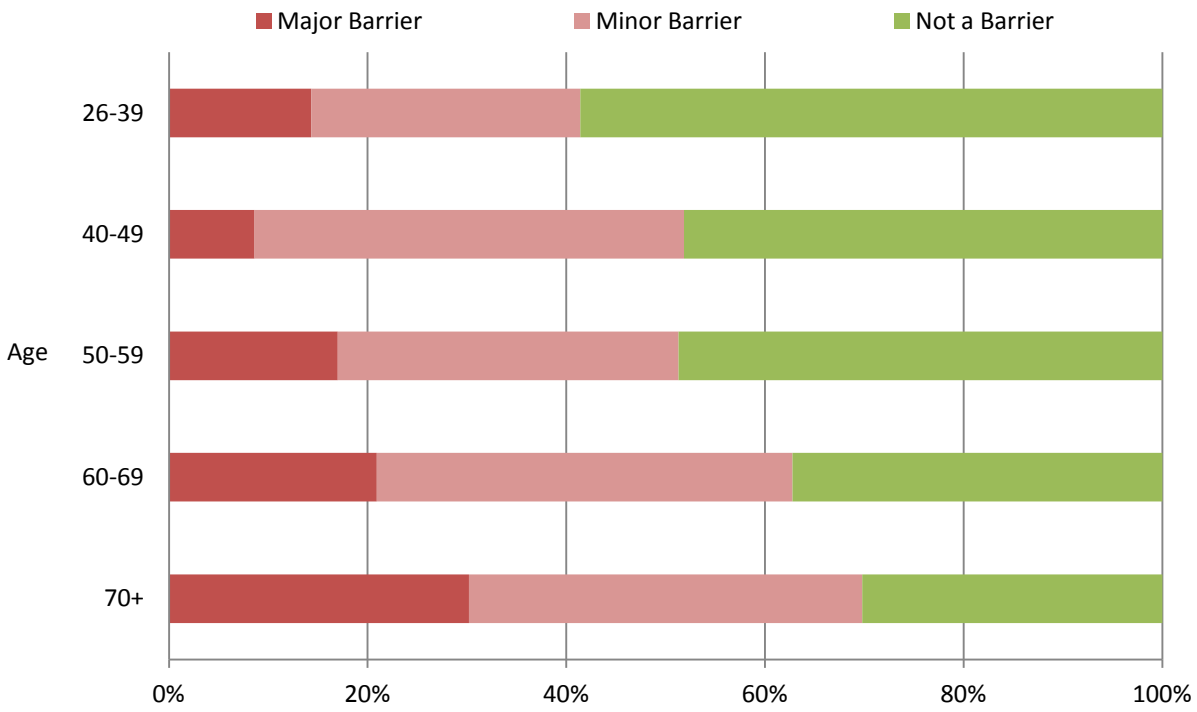
Figure 5.8: Effect of Electronic Patient Care Summaries on Overall Healthcare Costs by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

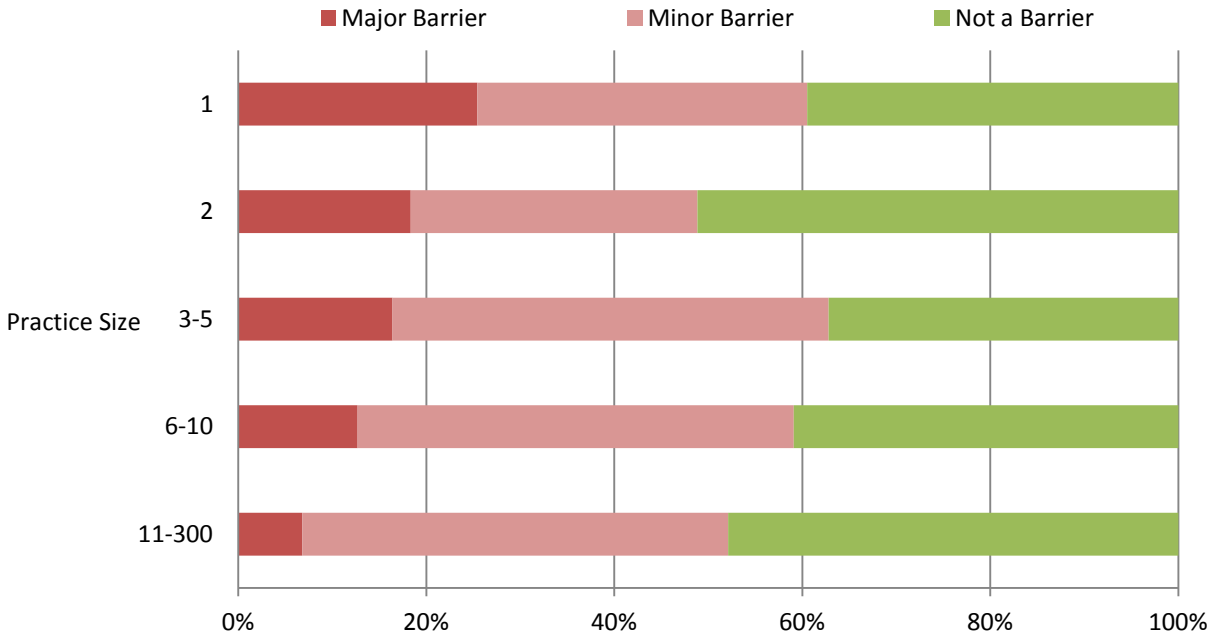
Across most barrier measures (except for computer technical support), older physicians were more likely to report implementing or expanding the use of exchanging electronic patient care summaries as a major barrier for their practice (see Figure 5.9). As practice size increased, computer skills of physician/staff, computer technical support, ongoing financial costs, training (productivity loss), and lack of time to acquire knowledge about the systems were less likely to be reported as major barriers by physicians (see Figure 5.10). Privacy or security concerns were more likely to be reported as a minor barrier by large practices and as a major barrier by specialists (see Figure 5.11).

Figure 5.9: Barriers to Implementing or Expanding the Use of Electronic Patient Care Summaries: Physician Skepticism of Benefits by Physician Age



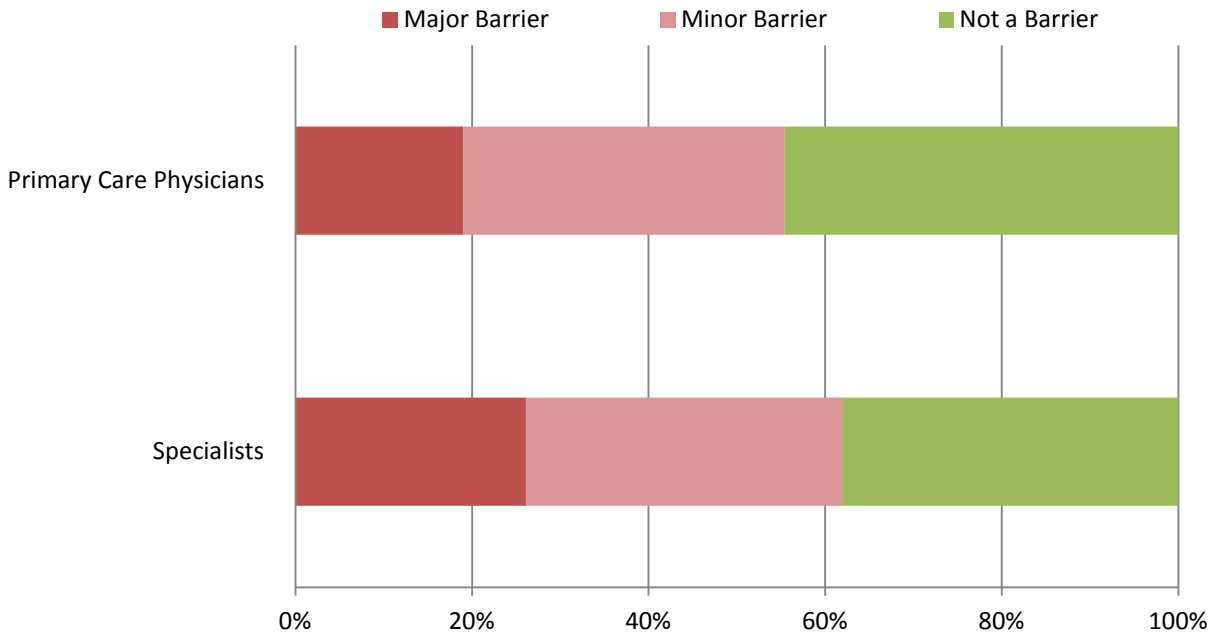
Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 5.10: Barriers to Implementing or Expanding the Use of Electronic Patient Care Summaries: Computer Skills of You/Staff by Practice Size



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Figure 5.11: Barriers to Implementing or Expanding the Use of Electronic Patient Care Summaries: Privacy or Security Concerns by Specialty



Source: 2013 New Jersey Physician Health IT Evaluation; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Conclusions

Over half of physicians (57.3%) provided a clinical visit summary to at least 50% of their patients. Less than half (42.9%) of physicians provided electronic patient care summaries to other providers. About one-quarter (23.0%) accessed electronic patient care summaries created by other providers. The majority of physicians felt that electronic patient care summaries would have a positive impact, especially for information availability (74.9%) and care coordination (72.4%). The exception was the impact on overall healthcare costs, where only 44.7% thought electronic patient care summaries would have a positive impact. For implementing or expanding the use of electronic patient care summaries, lack of uniform standards within the industry was the top barrier, followed by financial costs. Physician skepticism and computer skills were rarely cited as major barriers.

Younger physicians were more likely to provide electronic patient care summaries to other providers, and to report a positive effect of electronic patient care summaries on their practice. Larger practices were more likely to both provide and access electronic patient care summaries from other providers and to report a positive effect of electronic patient care summaries on their practice. Primary care physicians were more likely to report a positive impact on healthcare costs and patient satisfaction.

Table 5.8: Item Frequencies, Section C: Physician Use of Electronic Patient Care Summaries

	N	%
Total	**958**	**100.0**
Physicians that provide electronic patient care summaries to other providers	**400**	**42.9**
Physician that access electronic patient care summaries created by other providers	**213**	**23.0**
Impact of electronic patient care summaries (whether currently using or not)		
Workflow efficiency		
Very positive	232	26.5
Somewhat positive	297	34.0
No impact	148	16.9
Somewhat negative	122	13.9
Very negative	77	8.7
Patient safety		
Very positive	254	28.9
Somewhat positive	320	36.4
No impact	216	24.6
Somewhat negative	64	7.3
Very negative	25	2.9
Overall healthcare costs		
Very positive	163	18.7
Somewhat positive	227	26.0
No impact	235	26.9
Somewhat negative	153	17.5
Very negative	94	10.8
Report accuracy		
Very positive	221	25.4
Somewhat positive	338	38.7
No impact	226	25.9
Somewhat negative	54	6.2
Very negative	33	3.7
Information availability		
Very positive	327	37.3
Somewhat positive	329	37.6
No impact	153	17.5
Somewhat negative	42	4.8
Very negative	25	2.8

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 5.8: Item Frequencies, Section C: Physician Use of Electronic Patient Care Summaries

(continued)

	N	%
Care coordination		
Very positive	313	35.7
Somewhat positive	322	36.7
No impact	178	20.3
Somewhat negative	40	4.5
Very negative	24	2.8
Patient satisfaction		
Very positive	231	26.5
Somewhat positive	264	30.2
No impact	303	34.6
Somewhat negative	48	5.5
Very negative	29	3.3
Patient-doctor interaction		
Very positive	216	24.6
Somewhat positive	255	29.2
No impact	270	30.9
Somewhat negative	79	9.0
Very negative	55	6.3
Barriers to implementing or expanding use of electronic lab results/order entry (whether currently using or not)		
Computer skills of you/staff		
Not a barrier	358	41.9
Minor barrier	341	40.0
Major barrier	154	18.1
Computer technical support		
Not a barrier	260	30.5
Minor barrier	329	38.6
Major barrier	264	30.9
Privacy or security concerns		
Not a barrier	345	40.8
Minor barrier	304	36.0
Major barrier	196	23.2
Start-up financial costs		
Not a barrier	203	24.0
Minor barrier	255	30.2
Major barrier	387	45.8

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Table 5.8: Item Frequencies, Section C: Physician Use of Electronic Patient Care Summaries

(continued)

	N	%
Ongoing financial costs		
Not a barrier	195	22.9
Minor barrier	294	34.6
Major barrier	360	42.4
Training, productivity loss		
Not a barrier	212	25.0
Minor barrier	337	39.8
Major barrier	298	35.2
Physician skepticism		
Not a barrier	374	45.5
Minor barrier	311	37.8
Major barrier	138	16.7
Lack of time to acquire knowledge about systems		
Not a barrier	219	26.6
Minor barrier	368	44.7
Major barrier	236	28.7
Low participation by area labs		
Not a barrier	222	27.3
Minor barrier	312	38.4
Major barrier	278	34.3
Lack of uniform standards within industry (multiple systems)		
Not a barrier	176	21.4
Minor barrier	229	27.9
Major barrier	415	50.6
Technical limitations of systems		
Not a barrier	189	23.3
Minor barrier	306	37.7
Major barrier	317	39.0

Source: 2013 New Jersey Physician Health IT Evaluation Survey; data collection by Abt SRBI; tabulations by Rutgers Center for State Health Policy.

Chapter 6: Conclusions

Introduction

This chapter contains trends and conclusions across the previous five chapters.

Trends

For physicians, across most types of health IT, those not currently participating, older physicians, those in smaller practices, and specialists were less likely to adopt and more likely to report barriers to participation (particularly start-up and maintenance costs) and a negative impact of implementation on their practices. However, for most physicians who do participate, the perceived impact of health IT was high, although start-up and maintenance costs were still frequently cited as barriers.

For labs and pharmacies, those not participating reported more perceived barriers to participation and a more negative impact on their workflow and productivity.

Among physicians, labs, and pharmacies, the lack of uniform standards within the industry resulting in poor system compatibility was a major issue across all types of health IT. Also, all were interested in receiving more information, assistance, and incentives from the State in order to increase participation.

Major Findings for Each Chapter

E-Prescribing (Non-Participating Pharmacy Survey)

The leading factors for non-participation in e-prescribing were the financial burden on the pharmacy (start-up and maintenance costs, prescription transaction fees) and bugs in the systems. The most common major barrier to implementation was start-up costs. Other major barriers cited were prescription transaction fees, maintenance costs, and bugs in the e-prescribing process. Pharmacies believed that implementation would either not impact or might help in streamlining workflow and reducing processing time for patients. A large number of pharmacies were unaware of how e-prescribing works. The majority of them were not planning to implement e-prescribing in the future. Some shared interest in getting more

information. Most pharmacies were not aware of the existence of HIOs in their area and were not interested in participating in HIOs to exchange information.

E-Prescribing (Physician Survey)

Nearly three-fourths (72.5%) of physicians are currently transmitting prescriptions to pharmacies electronically. Implementation increased steadily from 2010 to 2012, with a slight drop-off in 2013. Among those currently e-prescribing, the vast majority (74.0%) uses e-prescribing for at least 60% of all their prescription orders. The most common method of e-prescribing is via an office EHR system.

Among those physicians not currently e-prescribing, nearly 80% plan to implement e-prescribing within the next two years. The main reasons for not adopting e-prescribing included start-up and maintenance costs of the system. Across most measures, a large majority of physicians felt that e-prescribing would have a positive impact on their practice. This was especially true for information availability, report accuracy, and patient safety. The exceptions were the impact of e-prescribing on overall healthcare costs and on the patient-doctor interaction. For implementing or expanding e-prescribing in their practice, start-up financial cost was the top barrier cited. This was closely followed by technical limitations of systems, lack of uniform standards within the industry, ongoing financial costs, and training and productivity loss.

Physicians ages 70 and over, solo physicians and those in very large practices, and specialists were significantly less likely to transmit prescriptions to pharmacies electronically. Among physicians not currently e-prescribing, younger physicians, large practice sizes, and specialists were less likely to e-prescribe. Older physicians (with the exception of physicians 70 and over), smaller practices, and primary care physicians were more likely to report financial cost of the system as the main reason for not e-prescribing. Primary care physicians, younger physicians, and larger practices were more likely to report a positive impact of e-prescribing on their practice. Across most barrier measures, older physicians were more likely and larger practice sizes were less likely to report that beginning or expanding e-prescribing would be minor or major barriers for their practice. Physician skepticism and lack of time to acquire knowledge about systems were more likely to be reported as major barriers by solo physicians.

Electronic Lab Order/Delivery (Clinical Lab Survey)

The most common barriers to ***viewing*** electronic lab orders were financial burden (installation and operating costs) and a limited number of healthcare providers with the capability to place electronic lab orders. Among the 32.9% of labs that lack the capability to accept electronic lab orders, over half have an implementation plan. The major barriers to implementing electronic

reporting of laboratory results were financial burden (subscription rates for exchange service providers) and lack of harmonization of industry accepted standards. Among the 13.3% of labs that were not capable of ***sending*** test results electronically, 80% have an implementation plan. Overall, the perceived impact of electronic lab order and electronic delivery of laboratory results was positive. The technology related skill in greatest need was laboratory persons who bridge the knowledge between IT and lab.

Electronic Lab Order/Delivery (Physician Survey)

Nearly two-thirds (62.6%) of NJ's physicians are currently ***viewing*** test results from clinical labs electronically, and nearly two-thirds (63.3%) of these view at least 60% of their lab results electronically, primarily through an office EHR system. Among those not viewing lab test results electronically (37.4%), 60.7% have no plans to view lab results electronically in the future. Financial costs are cited by about a third as the main reason for not viewing lab results electronically.

For ***sending*** lab test requests electronically, fewer participate (37.1%), but again, nearly two-thirds (65.5%) of these send at least 60% of their lab requests electronically, and again, primarily through an office EHR system. Among those not sending lab requests electronically (61.5%), about two-thirds (63.7%) have no plans to gain this capacity in the future. Financial costs are again cited most often as the main reason for not sending lab requests electronically, followed by low participation by surrounding labs.

A large majority of physicians felt that electronic lab requests/results delivery would have a positive impact on most aspects of their practice. This was especially true for care coordination and information availability. The exceptions were impact on overall healthcare costs and patient-doctor interaction where less than half thought it would have a positive impact. For implementing or expanding the use of electronic lab requests/results delivery, start-up financial costs was the top barrier cited.

Physicians ages 60 and over, solo physicians, and specialists were significantly less likely to ***view*** test results from clinical labs electronically. Primary care physicians and physicians in larger practices were more likely, whereas older physicians were less likely to view 60% or more of their lab results electronically. Among those not viewing lab results electronically, physicians ages 40-59 and primary care physicians are more likely to plan to get this capability in the future. Financial cost of the system (startup/ongoing) was more likely to be reported as the main reason for not viewing lab results electronically by all physician age groups (with the exception of physicians ages 40-49) and primary care physicians.

For ***sending*** lab results electronically, solo physicians and those in two-physician practices were less likely to send lab test requests electronically. Specialists were about half as likely to do so, while physician age was unrelated to this capability. Among those not sending lab orders electronically, physicians ages 40-59 and primary care physicians were more likely to gain this capability in the future. Primary care physicians were more likely to report financial cost of the system (start-up/ongoing) as the main reason for not sending lab orders electronically.

Older physicians were less likely to report a positive effect of electronically ***sending and viewing*** lab orders on their practice. Primary care physicians and larger practices were more likely to report a positive impact of electronically sending and viewing lab orders on their practice. For many barrier measures, older physicians were more likely and larger practices were less likely to report beginning or expanding the use of electronic lab results/order entry as barriers for their practice. Solo physicians were more likely to report lack of time to acquire knowledge about systems as a major barrier, whereas specialists were more likely to report privacy or security concerns, financial costs of the system, low participation by area labs, and lack of uniform standards as minor or major barriers for their practice.

Electronic Health Records (EHRs) (Physician Survey)

Nearly half (48.9%) of NJ physicians are currently maintaining 100% of patient records in their EHR system. Among those using an EHR system, about six in 10 (56.7%) provided a clinical visit summary from their main practice EHR to at least 50% of their patients. About four in 10 (43.2%) used a summary of care document for transitions of care for at least 50% of their patients. A little more than half (52.4%) currently use a CCHIT-certified EHR system, and about five in 10 (52.1%) received an EHR incentive payment from CMS for adoption and/or meaningful use of a certified EHR. Among those not currently using the system, more than half (51.5%) have no plans to gain this capability in the future.

Physicians in larger group practices were more likely to maintain 100% of their patient records on an EHR system; provide a clinical visit summary from their EHR to 100% of their patients; implement new technology in an earlier phase; and receive an incentive payment from CMS for the adoption and/or meaningful use of a certified EHR. Physicians ages 69 and younger were more likely to maintain 100% of their patient records on an EHR system. Specialists were less likely to use a summary of care document for transitions of care for their patients as compared to primary care physicians.

Among those not currently using an EHR, as practice size increased, physicians were more likely to implement an EHR system in the future. Specialists were less likely to adopt an EHR system

at their practice, and physicians ages 40 and over were more likely to never implement an EHR at their practice.

HIO Participation (Physician Survey and Interview)

A small number of physicians from the 2013 physician mail survey were aware of an HIO in their area and the services they provide and even smaller numbers were participating in one or more regional HIOs in their area. Among all six HIOs in NJ, the physician participation was highest for Virtua.

Physicians participating in an HIO reported a moderate level of understanding of how data is shared through an HIO but were unaware of how they are funded. The majority of physicians were somewhat satisfied with sharing health information with their HIOs and also other providers, but felt that integrating information from an HIO into their workflow is somewhat difficult. Most physicians felt a very or somewhat positive impact of electronic sharing of information via an HIO on their practice. However, some physicians felt that it would have a somewhat negative impact on productivity and healthcare costs. Training time (productivity loss) was the leading barrier to HIO participation, followed by computer technical support and lack of uniform standards within the industry. The most frequent responses for other services or information that physicians would like to get from an HIO were for lab reports and cardiology reports. The most frequently cited reason for dissatisfaction was the incapability of the infrastructure to provide easier access to patient information. The more commonly cited support needed from the State was for standardization of the system, communication with physicians about the benefits of participation in an HIO, and making HIOs fully operational.

Among physicians not participating in an HIO, the majority were aware of how data is shared through an HIO but were unaware of how they are funded. The level of understanding of physicians for how HIO data exchange works varied from “none” to “moderate” level. Most physicians said that they were not aware of an HIO in their area and shared an interest in joining an HIO. Most physicians felt that the impact of electronic sharing of information via an HIO would have a very or somewhat positive impact on their practice. However, some physicians felt that it would negatively impact productivity. Some additional factors shared were staff time, steep learning curve, and difficulty in coordinating vendors for data sharing. For barriers to beginning participation in an HIO, ongoing financial costs, personnel and /or time to select and implement the HIO system, and training time (productivity loss) were the leading barriers. The most frequently cited reason for not participating was the lack of an opportunity to participate, followed by cost, complexity of set up and maintenance, and multiple incompatible systems. The more commonly cited support needed from the State was

for standardization and facilitation of the process and making the information available to physicians, followed by financial and technical support incentives to reduce costs.

HIO Participation (HIO Use Metrics)

The number of affiliated hospitals increased for all five HIOs that provided data in 2013.

Electronic Clinical Summaries (Physician Phone/Fax Interview)

Physicians who use clinical summaries indicated benefits to patients, improved accuracy of clinical information, and benefits to other providers. The most frequently cited workflow adjustments necessary to implement clinical summaries for the majority of physicians was entering information during the appointment. Drawbacks to the use of clinical summaries were time and paper waste. More than half of physicians exchanged clinical summaries with other providers and electronic system compatibility was a major concern.

For physicians who do not use clinical summaries, cost and time were the main reasons for not implementing clinical summaries in their practices. Few physicians reported receiving information from any source about implementing clinical summaries. There was a range of EHR skill level with some physicians indicating that EHRs have limited clinical value or that the nature of their practice does not support the use of EHRs. Nearly half of physicians plan to implement clinical summaries in the future.

Electronic Clinical Summaries (Physician Survey)

Over half of physicians (57.3%) provided a clinical visit summary to at least 50% of their patients. Less than half (42.9%) of physicians provided electronic patient care summaries to other providers. About one-quarter (23.0%) accessed electronic patient care summaries created by other providers. The majority of physicians felt that electronic patient care summaries would have a positive impact, especially for information availability and care coordination. The exception was the impact on overall healthcare costs, where less than half thought electronic patient care summaries would have a positive impact. For implementing or expanding the use of electronic patient care summaries, lack of uniform standards within the industry was the top barrier, followed by financial costs.

Younger physicians were more likely to provide electronic patient care summaries to other providers, and to report a positive effect of electronic patient care summaries on their practice. Larger practices were more likely to both provide and access electronic patient care summaries from other providers and to report a positive effect of electronic patient care summaries on their practice. Primary care physicians were more likely to report a positive impact on healthcare costs and patient satisfaction.

Appendix A: Pharmacy Survey Cover Letter, Questionnaire

State of New Jersey
DEPARTMENT OF HEALTH
PO BOX 360
TRENTON, N.J. 08625-0360
www.nj.gov/health

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

MARY E. O'DOWD, M.P.H.
Commissioner

Dear Pharmacy Manager,

The New Jersey Department of Health is actively working to evaluate the state's implementation of Health Information Technology (HIT) and has partnered with Rutgers Center for State Health Policy (CSHP) to better understand health information technology (health IT) adoption and health information exchange activity in the State. Rutgers CSHP is conducting a short mail survey of non e-prescribing pharmacies to understand barriers to implementing electronic-prescribing and future plans for implementation. This survey can be completed by you, the pharmacy manager, or by a pharmacist or other staff member familiar with your practice setting.

This survey is confidential. The information collected is stored on a secure server and access to it is limited to CSHP research staff and the Institutional Review Board at Rutgers. You as an individual will not be linked to any reports using the data; only information for groups of people will be reported. The interview will take about 10 minutes. Your participation is voluntary and attaches no foreseeable risks or benefits to you personally. You may choose not to answer any questions with which you are not comfortable.

Your feedback is vital to understanding the barriers to HIT implementation in the state of New Jersey. We thank you in advance for your time and input. Your response by November 13, 2013, would be greatly appreciated. A prepaid, addressed return envelope is enclosed for your convenience.

Sincerely,

Eileen Troutman

Eileen Troutman
Acting New Jersey HIT Coordinator

This informed consent form was approved by the Rutgers University Institutional Review Board for the Protection of Human Subjects on 10-16-2013: approval of this form expires on 4-25-2014.

If you have questions about this survey, please contact:

Susan Brownlee, Rutgers Center for State Health Policy: Tel: 848-932-4666, Email: sbrownlee@ifh.rutgers.edu

If you have questions about your rights as a research subject, you may contact the Rutgers IRB Administrator at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs, 3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 848-932-0150, Email: humansubjects@orsp.rutgers.edu

New Jersey *Pharmacy* Health Information Technology (HIT) Evaluation

NJ Health New Jersey Department of Health

RUTGERS Center for State Health Policy

Complete by the pharmacy manager, pharmacist, or other staff member most knowledgeable about your pharmacy practice.

MARKING INSTRUCTIONS: *Correct Mark* ☒

Pharmacy phone #: _____ Number of pharmacists working in your pharmacy: _____

Job title/position of person completing this questionnaire: _____

1. Does your pharmacy use electronic prescribing (e-prescribing) such as the Surescripts system?

◯ No ◯ Yes (*if Yes, end survey and return it in the enclosed stamped, addressed envelope*)

2. Please select the category that best describes your pharmacy: (*mark one*)

◯ Chain
◯ Government
◯ Franchise
◯ Alternate dispensing site
◯ Independent
◯ Other (*please specify*) _____

3. Select the number range that best describes your average prescription dispensing volume *PER DAY* (all types – new and renewals): (*mark one, best estimate is fine*)

◯ 0 to 50 per day
◯ 51 to 100 per day
◯ 101 to 300 per day
◯ 301 to 500 per day
◯ Over 500 per day

4. Rate your level of understanding of how e-prescribing works: (*mark one*)

◯ Deep understanding of e-prescribing
◯ Familiar with broad e-prescribing terms/concepts
◯ Know very little about e-prescribing terms/concepts
◯ No knowledge about e-prescribing

5. Do you have any plans to implement e-prescribing in the future?

◯ No (*if No, go to Question 6)* ◯ Yes

a. If yes, when do you plan to implement it?

◯ Within 6 months
◯ 6 months to 1 year
◯ 1 year to 2 years
◯ More than 2 years

6. How much of a *barrier* is each of the following to implementing e-prescribing in your pharmacy: (*mark one per row*)

	Not a Barrier	Minor Barrier	Major Barrier
Start-up costs	◯	◯	◯
Converting existing data into the e-prescribing system	◯	◯	◯
Maintenance costs	◯	◯	◯
Potential for an incomplete patient medication list	◯	◯	◯
Changes to existing workflow	◯	◯	◯
Prescription transaction fees	◯	◯	◯
Low prescriber activity in the area	◯	◯	◯
Network connections in my area	◯	◯	◯
Network costs	◯	◯	◯
Bugs in e-prescribing process (e.g., poor software design, vendor support, downtime)	◯	◯	◯
Concerns about security of patient data	◯	◯	◯
Concerns about privacy of patient data	◯	◯	◯
Impact on "impulse buy" sales (e.g., consumer purchases while waiting for Rx)	◯	◯	◯
I am planning to retire soon	◯	◯	◯
Other (*please specify*) _____	◯	◯	◯

7. Of these factors, which is the *most important barrier* for your pharmacy? (*mark one*)

- ◯ Start up costs
- ◯ Converting existing data into the e-prescribing system
- ◯ Maintenance costs
- ◯ Potential for an incomplete patient medication list
- ◯ Changes to existing workflow
- ◯ Prescription transaction fees
- ◯ Low prescriber activity in the area
- ◯ Network connections in my area
- ◯ Network costs
- ◯ Bugs in e-prescribing process (e.g., poor software design, vendor support, downtime)
- ◯ Concerns about security of patient data
- ◯ Concerns about privacy of patient data
- ◯ Impact on "impulse buy" sales (e.g., consumer purchases while waiting for Rx)
- ◯ I am planning to retire soon
- ◯ Other (*please specify*) _____

8. Overall, do you think e-prescribing would have a positive influence, negative influence, or no effect on the following components of your pharmacy practice? (*mark one per row*)

	Very positive	Somewhat positive	No effect	Somewhat negative	Very negative
Efficiency (e.g., streamlining workflow)	◯	◯	◯	◯	◯
Safety (e.g., enabling checks for medication errors, drug interactions, and drug allergies)	◯	◯	◯	◯	◯
Patient-centeredness (e.g., reducing process time for patients)	◯	◯	◯	◯	◯
Effectiveness (e.g., improving the ability to track patient medication adherence)	◯	◯	◯	◯	◯
Timeliness (e.g., reducing turnaround time for prescriptions)	◯	◯	◯	◯	◯
Access to patient medication history	◯	◯	◯	◯	◯
Convenience (e.g., faster turnaround, fewer callbacks, fewer misplaced prescriptions, remote access)	◯	◯	◯	◯	◯
Communication with the patient	◯	◯	◯	◯	◯
Communication with the physician	◯	◯	◯	◯	◯
Overall relations with the patient	◯	◯	◯	◯	◯
Other (*please specify*) _____	◯	◯	◯	◯	◯

9. What percentage most closely estimates *current* physician adoption of e-prescribing in your pharmacy's area? (*mark one*)

- ◯ 0%
- ◯ 1% to 20%
- ◯ 21% to 40%
- ◯ 41% to 60%
- ◯ 61% to 80%
- ◯ 81% to 100%
- ◯ Don't know

10. What estimated level of e-prescribing activity by physicians in your area would *prompt you* to implement e-prescribing? (*mark one*)

- ◯ 1% to 20%
- ◯ 21% to 40%
- ◯ 41% to 60%
- ◯ 61% to 80%
- ◯ 81% to 100%
- ◯ Will only accept written prescriptions or call-in prescriptions

11. Is implementing e-prescribing a priority in your pharmacy?

◯ Yes ◯ No

12. If fully implemented in your pharmacy, do you think e-prescribing would save time?

◯ Yes ◯ No

13. Are you aware of health information organizations (HIOs) in your area and the services they provide?
(*New Jersey HIOs: Camden Coalition, Health-e-cITi-NJ, Jersey Health Connect, NJSHINE, Trenton HIE, Virtua*)

◯ Yes ◯ No

a. Are you interested in participating in one of these six New Jersey HIOs?

◯ Yes ◯ No

a1. If YES, which of the following HIOs do you plan to exchange information with? (*mark all that apply*)

- ☐ Camden Coalition
- ☐ Health-e-cITi-NJ
- ☐ Jersey Health Connect
- ☐ NJSHINE
- ☐ Trenton HIE
- ☐ Virtua

14. Please share any other comments or suggestions you have about e-prescribing:

Thank you. *Please return in the enclosed stamped, addressed envelope or mail to:*

NJ Health
New Jersey Department of Health

RUTGERS
Center for State Health Policy

Appendix B: 2013 Physician Survey Documents

Appendix B.1: Methods Report for the Physician Survey

To: Susan Brownlee, PhD, Senior Research Manager
Center for State Health Policy (CSHP)
Rutgers, The State University of New Jersey

From: Jeremy Wells & Jesse Rude, Abt SRBI

CC: Mark Morgan, Abt SRBI

Date: February 5, 2014

Subject: **Methodology Report – 2013 Physician Survey**
Evaluation of the State of New Jersey's Health Information Technology (Health IT) Program

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Overview

As part of the State of New Jersey's Health Information Technology (Health IT) Operational Plan, the Center for State Health Policy (CSHP) is conducting an evaluation of the New Jersey health IT program. The areas being evaluated include three key health IT use criteria: 1) e-prescribing by pharmacies and providers, 2) electronic lab results by laboratories and providers, and 3) use of patient care summaries by providers, and provider participation in regional health information organizations (HIOs). Data are being collected from pharmacies, laboratories, and physicians via mail surveys and structured phone interviews, along with Use Metrics from regional HIOs.

In October of 2013, Abt SRBI was tasked with surveying New Jersey-based physicians by mail about their experiences with electronic health record (EHR) systems, e-prescribing, electronic lab orders, electronic patient care summaries, and participation in regional HIOs. This memo describes the methods used to conduct the survey mailings, enter the data, and calculate the survey weights. The survey instrument, a copy of the accompanying cover letter, and details on the physician classification codes used in the weighting can be found in Appendices B.1, B.2, and B.4.

Sample

On September 20, 2013, CSHP obtained a list sample of 5,600 licensed physicians in New Jersey from Medical Marketing Service, Inc. (MMS). The sample file included the physicians' names, mailing addresses, and codes representing their type of practice, present employment, and primary American Medical Association (AMA) specialty.

Mailings

Abt SRBI used the sample file to generate two mailings. The first mailing was sent to all 5,600 physicians in the sample file on Friday, October 11, 2013. The second mailing was sent to a subset of 5,027 physicians on Friday, November 1, 2013. The second mailing excluded the 526 physicians who had already returned a completed survey from the first mailing and an additional 47 physicians whose first mailing was returned to Abt SRBI and labeled by the US Postal Service (USPS) as undeliverable.

Each mailing consisted of a single-sided, 1-page cover letter; a double-sided, 2-page survey booklet; and a prepaid, addressed return envelope. The cover letter was printed in color on NJ Department of Health letterhead, addressed to each physician personally, and included the electronic signature of Eileen Troutman, Acting NJ Health IT Coordinator. The cover letter briefly explained the goals and importance of the survey, emphasized its voluntary nature and confidentiality provisions, and requested that the sampled physician or another knowledgeable staff member complete and return the survey by October 31, 2013. The cover letter also provided contact information for CSHP so respondents could obtain more information about the study and verify its legitimacy.

Surveys were printed in color on both sides of 11" x 17" paper, which was folded in half to create the self-administered survey booklets. The survey was designed by CSHP and consisted of seven sections:

A) E-Prescribing
B) Electronic Lab Results
C) Electronic Patient Care Summaries
D) Health Information Organizations (HIOs)
E) Electronic Health Records (EHRs)
F) General Questions about this *Practice*, and
G) General Questions about the *Physician* who received this mail survey.

The outer mailing envelopes were green and prominently displayed the names and logos of the Rutgers CSHP and the NJ Department of Health to further assure legitimacy (see Appendix B.1, B.2, and B.3 for a copy of the survey, the cover letter, and the envelope label).

Response to the Survey

A total of 958 completed surveys were successfully returned to Abt SRBI's West Long Branch, NJ office. This number includes 526 surveys returned in response to the first mailing and 432 surveys returned in response to the second mailing. A total of 17 surveys were returned but determined to be partial/incomplete and 70 surveys were returned unopened by USPS because they could not be delivered as addressed. The remainder of the 5,600 sample records – 4,555 potential respondents – did not return a survey within the time period allotted. This includes 16 surveys received after the study deadline.

Excluding the 70 surveys returned unopened gives us an adjusted sample size of 5,530 physicians. Thus, 17.3% of the valid sample (958 of 5,530) successfully responded to the survey by the deadline.

Data Entry

The 958 completed surveys were divided among a small group of coders for data entry. For quality assurance purposes, each survey's data was independently entered into Abt SRBI's secure web portal by two different coders, yielding a dataset containing two sets of information for each respondent (958 x 2 = 1,916 records). The Project Director wrote syntax that compared the information entered by the two independent coders on an item-by-item basis. When there was a discrepancy between the two coders on an item, the Project Director located the physical survey instrument, determined the correct response, and made the change to the dataset. Ambiguous or illegible responses were coded like item non-responses (i.e., assigned a code of 88). Data entry began on Wednesday, October 16, 2013 and was concluded on Tuesday, December 3, 2013.

A total of 29 surveys were determined to be duplicates – the result of the overlap of the two mailings and/or staff at the same physician's office responding to both. Duplicate responses were set aside and not entered into the dataset. Once all discrepancies between the two coders were resolved, an unweighted dataset was produced with one record per respondent (N=958).

Data Security

To ensure confidential tracking of survey completion, the survey instruments and envelopes included a respondent ID number unique to each sample record in each mailing, and no personally identifying information (PII) was requested by the survey instrument. Abt SRBI maintained a secure database separate from the survey data that linked sample record information to the respondent IDs for each mailing. Only Project Directors assigned to this study were granted access to the sample record database.

Data entry was performed on a password-protected web interface by a small team of authorized personnel. Hard copies of the completed survey forms were stored in locked filing cabinets until the end of the field period, when they were delivered to CSHP. The return envelopes were securely destroyed. The final survey data were securely uploaded to CSHP on December 11, 2013 as an SPSS dataset with no PII included.

Weighting

Prior to final data delivery, Abt SRBI calculated survey weights based on population control totals for medical specialization. Each record is assigned a weight based on its proportional representation of one of five physician categories, derived from the wider set of AMA medical specialty codes: (1) Primary Care Specialties, (2) Medical Subspecialties, (3) Surgical Subspecialties, (4) Hospital Based Specialties, and (5) Other Specialties. A list of AMA medical specialty codes and their 5-category specialty classification is provided in Appendix B.4.

By applying the weights, researchers using the data can generalize findings to the larger population of licensed physicians in New Jersey. Two weight variables are included in the final dataset:

- WTTOT can be used to weight up to the total count of survey respondents (N=958), and
- WTPOP can be used to weight up to the total population of licensed physicians in New Jersey (N=18,621).

Appendix B.2: Final Survey Instrument

NJ Health — New Jersey Department of Health

New Jersey *Provider* Health Information Technology (HIT) Evaluation

RUTGERS — Center for State Health Policy

Complete by physician, admin, office mgr, or other staff familiar with your practice information systems

MARKING INSTRUCTIONS: Correct Mark ☒

Please answer in reference to your main practice location

Section A: E-Prescribing

1. Do you transmit prescriptions to pharmacies electronically ("e-prescribing") from your main practice location?
(include any electronic transmission such as email or internet; do not include transmitting prescriptions via fax)

○ **YES** ▼

a1. What year did you first implement e-prescribing?

____ ____ ____ ____ (year)

a2. What percentage of your prescription orders are sent electronically to a pharmacy? *(mark one)*

- ○ 60% or more
- ○ 40%–59%
- ○ 20% - 39%
- ○ Less than 20%

a3. How do you e-prescribe? *(mark all that apply)*

- ☐ Office EHR System
- ☐ External Web Portal
- ☐ E-mail
- ☐ Other _____

○ **NO** ▼

b1. Do you plan to implement e-prescribing in the near future?

○ Yes ○ No

If yes, when do you plan to implement?

○ 2013 ○ 2014 ○ 2015 ○ After 2015

b2. What is your main reason for not adopting e-prescribing?

- ○ Financial cost of system (start-up / ongoing)
- ○ Low participation by surrounding pharmacies
- ○ Computer skills of you and/or colleagues/staff
- ○ Training and productivity loss
- ○ Physician skepticism of benefits
- ○ Other _____

2. For each outcome below, indicate whether you think the impact of e-prescribing is or would be positive, negative, or no impact:
(mark one per row)

	Very Positive	Somewhat Positive	No Impact	Somewhat Negative	Very Negative
a) Workflow efficiency	○	○	○	○	○
b) Patient safety	○	○	○	○	○
c) Overall healthcare costs	○	○	○	○	○
d) Report accuracy	○	○	○	○	○
e) Information availability	○	○	○	○	○
f) Care coordination	○	○	○	○	○
g) Patient satisfaction	○	○	○	○	○
h) Patient-doctor interaction	○	○	○	○	○

3. How much of a barrier is each of the following to beginning or expanding the use of e-prescribing in your practice?
(mark one per row in both columns)

	Not a Barrier	Minor Barrier	Major Barrier
a) Computer skills of you/staff	○	○	○
b) Computer technical support	○	○	○
c) Privacy or security concerns	○	○	○
d) Start-up financial costs	○	○	○
e) Ongoing financial costs	○	○	○
f) Training, productivity loss	○	○	○

	Not a Barrier	Minor Barrier	Major Barrier
g) Physician skepticism	○	○	○
h) Lack of time to acquire knowledge about systems	○	○	○
i) Low participation by area labs	○	○	○
j) Lack of uniform standards within industry (multiple systems)	○	○	○
k) Technical limitations of systems	○	○	○
l) Other _____	○	○	○

Section B: Electronic Lab Results

4. Are you able to view lab results electronically from your primary practice location?

◯ YES ▼

a1. What year did you begin viewing lab results electronically?

___ ___ ___ ___ (year)

a2. What percentage of lab results do you view electronically *(mark one)*

◯ 60% or more ◯ 20% - 39%
◯ 40%–59% ◯ Less than 20%

a3. How do you view lab results? *(mark all that apply)*

☐ Office EHR System ☐ E-mail
☐ External Web Portal ☐ Other _____

◯ NO ▼

b1. Do you plan to be able to view lab results electronically in the near future?

◯ Yes ◯ No
If yes, when? ◯ 2013 ◯ 2014 ◯ 2015 ◯ After 2015

b2. What is your main reason for not being able to view lab results electronically?

◯ Financial cost of system (start-up / ongoing)
◯ Low participation by surrounding labs
◯ Computer skills of you and/or colleagues/staff
◯ Training and productivity loss
◯ Physician skepticism of benefits
◯ Other _____

5. Are you able to send lab orders electronically from your primary practice location?

◯ YES ▼

a1. What year did you begin sending lab orders electronically?

___ ___ ___ ___ (year)

a2. What percentage of lab orders do you send electronically? *(mark one)*

◯ 60% or more ◯ 20% - 39%
◯ 40%–59% ◯ Less than 20%

a3. How do you send lab orders? *(mark all that apply)*

☐ Office EHR System ☐ E-mail
☐ External Web Portal ☐ Other _____

◯ NO ▼

b1. Do you plan to be able to send lab orders electronically in the near future?

◯ Yes ◯ No
If yes, when? ◯ 2013 ◯ 2014 ◯ 2015 ◯ After 2015

b2. What is your main reason for not being able to send lab orders electronically?

◯ Financial cost of system (start-up / ongoing)
◯ Low participation by surrounding labs
◯ Computer skills of you and/or colleagues/staff
◯ Training and productivity loss
◯ Physician skepticism of benefits
◯ Other _____

6. For each outcome below, indicate whether you think the impact of electronic lab results/order entry is or would be positive, negative, or no impact: *(mark one box per row)*

	Very Positive	Somewhat Positive	No Impact	Somewhat Negative	Very Negative
a) Workflow efficiency	◯	◯	◯	◯	◯
b) Patient safety	◯	◯	◯	◯	◯
c) Overall healthcare costs	◯	◯	◯	◯	◯
d) Report accuracy	◯	◯	◯	◯	◯
e) Information availability	◯	◯	◯	◯	◯
f) Care coordination	◯	◯	◯	◯	◯
g) Patient satisfaction	◯	◯	◯	◯	◯
h) Patient-doctor interaction	◯	◯	◯	◯	◯

7. How much of a barrier is each of the following to beginning or expanding the use of electronic lab results/order entry in your practice? *(mark one box per row in both columns)*

	Not a Barrier	Minor Barrier	Major Barrier
a) Computer skills of you/staff	◯	◯	◯
b) Computer technical support	◯	◯	◯
c) Privacy or security concerns	◯	◯	◯
d) Start-up financial costs	◯	◯	◯
e) Ongoing financial costs	◯	◯	◯
f) Training, productivity loss	◯	◯	◯

	Not a Barrier	Minor Barrier	Major Barrier
g) Physician skepticism	◯	◯	◯
h) Lack of time to acquire knowledge about systems	◯	◯	◯
i) Low participation by area pharmacies	◯	◯	◯
j) Lack of uniform standards within industry (multiple systems)	◯	◯	◯
k) Technical limitations of systems	◯	◯	◯
l) Other _____	◯	◯	◯

Section C: Electronic Patient Care Summaries

8. Do you provide electronic patient care summaries to other providers? ○ Yes ○ No

9. Do you access electronic patient care summaries created by other providers? ○ Yes ○ No

10. For each outcome below, indicate whether you think the impact of electronic patient care summaries is or would be positive, negative, or no impact: *(mark one box per row)*

	Very Positive	Somewhat Positive	No Impact	Somewhat Negative	Very Negative
a) Workflow efficiency	○	○	○	○	○
b) Patient safety	○	○	○	○	○
c) Overall healthcare costs	○	○	○	○	○
d) Report accuracy	○	○	○	○	○
e) Information availability	○	○	○	○	○
f) Care coordination	○	○	○	○	○
g) Patient satisfaction	○	○	○	○	○
h) Patient-doctor interaction	○	○	○	○	○

11. How much of a barrier is each of the following to beginning or expanding the use of exchanging electronic patient care summaries in your practice? *(mark one box per row in both columns)*

	Not a Barrier	Minor Barrier	Major Barrier
a) Computer skills of you/staff	○	○	○
b) Computer technical support	○	○	○
c) Privacy or security concerns	○	○	○
d) Start-up financial costs	○	○	○
e) Ongoing financial costs	○	○	○
f) Training, productivity loss	○	○	○
g) Physician skepticism	○	○	○
h) Lack of time to acquire knowledge about systems	○	○	○
i) Low participation by area physicians	○	○	○
j) Lack of uniform standards within industry (multiple systems)	○	○	○
k) Technical limitations of systems	○	○	○
l) Other _____	○	○	○

Section D: Health Information Organizations (HIOs)

12. Are you aware of an HIO in your area and the services they provide? ○ Yes ○ No

13. Which of the following HIOs do you exchange information with? *(mark all that apply)*

☐ Camden Coalition ☐ Health-e-cITi-NJ ☐ Jersey Health Connect ☐ NJSHINE ☐ Trenton HIE ☐ Virtua ☐ None

Section E: Electronic Health Records (EHRs)

14. What percent of your patient records at this practice are maintained on an EHR System? *(0-100%, best estimate)* _____ %

a. If none, when do you plan to implement an EHR system at this practice?

○ 2013 ○ 2014 ○ After 2015 ○ Never ► *(go to question 17)*

b. For what percentage of your patients do you provide a clinical visit summary from your EHR? *(0-100%, best estimate)* _____ %

c. For what percentage of your patients do you use a summary of care document for transitions of care? *(0-100%, best estimate)* _____ %

15. Which of the following is the primary EHR system vendor you use? *(mark one)*

○ AbleMed	○ Care360	○ Enable Healthcare	○ MD On-line	○ OptumInsight	○ Pulse
○ Alere	○ Cerner	○ Epic Systems	○ Med A-Z	○ Orion Health	○ RelayHealth
○ Allscripts	○ Covisint	○ GE Healthcare	○ Medicity	○ PatientKeeper	○ Siemens
○ AmazingCharts	○ CureMD	○ Greenway	○ MedPluss	○ PerfectCare EHR	○ Suite MED
○ Aprima	○ DigiDMS	○ IBM	○ MIE	○ Practice Fusion	○ Vitera
○ AT&T	○ DocComply	○ Intersystems	○ Misys	○ Practice Partner	○ Homegrown system
○ Athena Health	○ eClinicalWorks	○ Lighthouse MD	○ NextGen	○ PriMedx	○ Have not yet chosen
○ Caradigm	○ e-MD	○ McKesson	○ Office Practicum	○ PrognoCIS	○ Other specify: _____

b. In which year did your practice install its EHR system? ___ ___ ___ ___ (calendar year)

c. Is your EHR system Certification Commission on Health Information Technology (CCHIT)-certified?

○ Yes ○ No ○ Don't Know

16. Did your practice receive either a Medicare or Medicaid EHR Incentive Payment for the adoption and/or meaningful use of a certified EHR?

○ Yes ○ No ○ Don't Know

Section F: General Questions about this *Practice*

17. How many physicians are in your practice at this location? (*best estimate is fine*) _____ (# Physicians)

18. Is this a single specialty or multi-specialty practice? ◯ Single Specialty Practice ◯ Multi-Specialty Practice

19. Characteristics of the physicians in your practice: (*best estimate is fine*)

# Males	# Females	# Ages < 40	# Ages 40–59	# Ages > 60	# Full-tme Physicians	# Part-time Physicians
_____	_____	_____	_____	_____	_____	_____

20. Indicate how many of each of these <u>other health professionals</u> are in your main office practice: (*best estimate is fine*)

(Advance Practice Nurses - APNs) # Nurse Practitioners	# Clinical Nurse Specialists	# Certified Nurse Midwives	# Certified Registered Nurse Anesthetists	# Physician Assistants
_____	_____	_____	_____	_____

21. How many years has this practice been in operation? _____ (years)

Section G: General Questions about *Physician* who received this mail survey

22. Age? _____ **23. Gender?** ◯ Male ◯ Female

24. What is your racial/ethnic origin? (*please mark all that apply*)

☐ Asian or Pacific Islander (non-Hispanic) ☐ White/Caucasian (non-Hispanic) ☐ Other, *specify*: _____
☐ Black/African American (non-Hispanic) ☐ Hispanic/Latino

25. Are you currently in active clinical practice? (*i.e., providing direct patient care*)

◯ No ◯ Yes, and my primary specialty is: (*mark one*)

◯ Anesthesia ◯ Internal Medicine ◯ Psychiatry
◯ Ear, Nose, and Throat ◯ Neurology ◯ Primary Care
◯ Emergency Medicine ◯ OB/GYN ◯ Radiology
◯ Family Medicine ◯ Pathology ◯ Urology
◯ General Surgery ◯ Pediatrics ◯ Other, *specify*: _____

26. Birthplace and location of medical school?

	Birthplace	Medical School (*mark all that apply*)
New Jersey	◯	☐
Other U.S.	◯	☐
Non-U.S.	◯	☐

27. About what percentage of your patients have the following primary sources of payment?

(*mark one in each row*)

	None	1–5%	6–10%	11–20%	21–40%	41–60%	61–100%
Medicare	◯	◯	◯	◯	◯	◯	◯
Medicaid/NJFamily Care	◯	◯	◯	◯	◯	◯	◯
Uninsured/Self-pay	◯	◯	◯	◯	◯	◯	◯
All Others (e.g., private, workers comp)	◯	◯	◯	◯	◯	◯	◯

28. Are you accepting NEW patients with the following payment sources? (*mark all that apply*)

☐ Medicaid ☐ NJFamilyCare ☐ Private Insurance ☐ None of these
☐ Medicare ☐ Uninsured/Self-pay ☐ Insurance through ACA Exchanges (beg. 2014)

29. Do you plan to retire within the ... (*mark one*) ◯ Next 2 years ◯ Next 5 years ◯ Next 10 years ◯ No plans to retire

This form was completed by: (*mark all that apply*)

☐ Physician ☐ Office Manager/Administrator ☐ IT Staff
☐ Other Medical Professional (NP, PA, etc.) ☐ Medical Assistant ☐ Other _____

NJ Health New Jersey Department of Health

Thank you. *Please return in the enclosed stamped, addressed envelope or mail to:*
NJ Provider HIT Evaluation, c/o Abt SRBI Inc.
185 State Route 36, Suite B3, West Long Branch, NJ 07764

RUTGERS Center for State Health Policy

Appendix B.3: Survey Cover Letter

State of New Jersey
DEPARTMENT OF HEALTH
PO BOX 360
TRENTON, N.J. 08625-0360
www.nj.gov/health

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

MARY E. O'DOWD, M.P.H.
Commissioner

Dear _____,

The New Jersey Department of Health is actively working to help healthcare providers adopt and demonstrate the "meaningful use" of electronic health record (EHR) systems. The Department of Health has partnered with Rutgers Center for State Health Policy (CSHP) to better understand health information technology (health IT) adoption and health information exchange activity in the State. Rutgers CSHP is conducting a short mail survey of New Jersey-based physicians in order to understand your experience with EHR systems, e-prescribing, electronic lab orders, electronic patient care summaries, and participation in regional health information organizations (HIOs). This survey can be completed by you the provider, or by an office manager, administrator, or other staff member familiar with your practice information systems.

This survey is confidential. The information collected is stored on a secure server and access to it is limited to CSHP research staff and the Institutional Review Board at Rutgers. You as an individual will not be linked to any reports using the data; only information for groups of people will be reported. The survey will take about 10 minutes. Your participation is voluntary and attaches no foreseeable risks or benefits to you personally. You may choose not to answer any questions with which you are not comfortable.

Your feedback is vital to understanding the barriers and benefits to HIT implementation in the state of New Jersey. We thank you in advance for your time and input. Your response by **October 31** would be greatly appreciated. A prepaid, addressed return envelope is enclosed for your convenience.

Sincerely,

Eileen Troutman

Eileen Troutman
Acting New Jersey Health IT Coordinator

This informed consent form was approved by the Rutgers University Institutional Review Board for the Protection of Human Subjects on 8-13-2013: approval of this form expires on 4-25-2014.

If you have questions about this survey, please contact:

Susan Brownlee, Rutgers Center for State Health Policy: Tel: 848-932-4666, Email: sbrownlee@ifh.rutgers.edu

If you have questions about your rights as a research subject, you may contact the Rutgers IRB Administrator at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs, 3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 848-932-0150, Email: humansubjects@orsp.rutgers.edu

Appendix B.4: Outer Envelope Label

Appendix B.5: AMA Physician Specialty Codes and 5-Category Classification

AMA Specialty Code	AMA Specialty Text	5-Category Code	5-Category Text
A	Allergy	2	Medical Subspecialties
ACA	Adult Cardiothoracic Anesthesiology	4	Hospital Based Specialties
ADL	Adolescent Medicine-Peds	1	Primary Care Specialties
ADM	Addiction Medicine	5	Other Specialties
ADP	Addiction Psychiatry	5	Other Specialties
AI	Allergy & Immunology	2	Medical Subspecialties
AM	Aerospace Medicine	5	Other Specialties
AMI	Adolescent Medicine	2	Medical Subspecialties
AN	Anesthesiology	4	Hospital Based Specialties
APM	Anesthesiology/pain Management	5	Other Specialties
AR	Abdominal Radiology	4	Hospital Based Specialties
AS	Abdominal Surgery	3	Surgical Subspecialties
ASO	Advanced Surgical Oncology	3	Surgical Subspecialties
ATP	Anatomic Pathology	4	Hospital Based Specialties
BBK	Blood Banking	4	Hospital Based Specialties
CCA	Critical Care - Anesthesiology	4	Hospital Based Specialties
CCM	Critical Care Medicine	2	Medical Subspecialties
CCP	Critical Care - Pediatric	1	Primary Care Specialties
CCS	Critical Care Surgery	3	Surgical Subspecialties
CD	Cardiovascular Disease	2	Medical Subspecialties
CFS	Craniofacial Surgery	3	Surgical Subspecialties
CG	Clinical Genetics	5	Other Specialties
CHN	Child Neurology	5	Other Specialties
CHP	Child Psychiatry	5	Other Specialties
CLP	Clinical Pathology	4	Hospital Based Specialties
CN	Clinical Neurophysiology	5	Other Specialties
CPP	Pediatrics/Psych/Child and Adol Psych	5	Other Specialties
CRS	Colon & Rectal Surgery	3	Surgical Subspecialties
CS	Cosmetic Surgery	3	Surgical Subspecialties
D	Dermatology	2	Medical Subspecialties
DBP	Developmental - Behavioral Pediatrics	1	Primary Care Specialties
DIA	Diabetes	2	Medical Subspecialties
DMP	Dermatopathology	2	Medical Subspecialties
DR	Diagnostic Radiology	4	Hospital Based Specialties
DS	Dermatologic Surgery	3	Surgical Subspecialties
EM	Emergency Medicine	5	Other Specialties
END	Endocrinology	2	Medical Subspecialties

AMA Specialty Code	AMA Specialty Text	5-Category Code	5-Category Text
ESM	Emergency/sports Medicine	5	Other Specialties
ESN	Endovascular Surgical Neuroradiology	3	Surgical Subspecialties
ETX	Emergency Medical Toxicology	5	Other Specialties
FOP	Forensic Pathology	4	Hospital Based Specialties
FP	Family Practice	1	Primary Care Specialties
FPG	Family Practice/geriatric Med	1	Primary Care Specialties
FPR	Female Pelvic Medicine and Reconstructive Surgery	3	Surgical Subspecialties
FPS	Facial Plastic Surgery	3	Surgical Subspecialties
FSM	Family Prac/sports Medicine	1	Primary Care Specialties
GE	Gastroenterology	2	Medical Subspecialties
GO	Gynecological Oncology	1	Primary Care Specialties
GP	General Practice	1	Primary Care Specialties
GPM	General Preventive Medicine	5	Other Specialties
GS	General Surgery	3	Surgical Subspecialties
GYN	Gynecology	1	Primary Care Specialties
HEM	Hematology	2	Medical Subspecialties
HEP	Hepatology	2	Medical Subspecialties
HMP	Hematology/pathology	4	Hospital Based Specialties
HNS	Head & Neck Surgery	3	Surgical Subspecialties
HO	Hematology/oncology	2	Medical Subspecialties
HOS	Hospitalist	2	Medical Subspecialties
HS	Hand Surgery	3	Surgical Subspecialties
HSO	Hand Surgery/orthopedic Surg	3	Surgical Subspecialties
HSP	Hand Surgery (Plastic Surgery)	3	Surgical Subspecialties
IC	Interventional Cardiology	2	Medical Subspecialties
ICE	Im - Cardiac Electrophysiology	2	Medical Subspecialties
ID	Infectious Diseases	2	Medical Subspecialties
IEC	IM/Emergency Medicine/Critical Care Medicine	1	Primary Care Specialties
IFP	Internal Medicine - Family Practice	1	Primary Care Specialties
IG	Immunology	2	Medical Subspecialties
IM	Internal Medicine	1	Primary Care Specialties
IMD	Internal Medicine/Dermatology	1	Primary Care Specialties
IMG	Internal Medicine - Geriatrics	1	Primary Care Specialties
ISM	Internal Medicine - Sports Med	2	Medical Subspecialties
MEM	Internal Medicine - Emergency Medicine	2	Medical Subspecialties
MFM	Maternal & Fetal Medicine	1	Primary Care Specialties
MG	Medical Genetics	5	Other Specialties
MGP	Molecular Genetic Pathology	4	Hospital Based Specialties
MP	Internal Medicine - Psychiatry	2	Medical Subspecialties

AMA Specialty Code	AMA Specialty Text	5-Category Code	5-Category Text
MPD	Internal Medicine - Pediatrics	1	Primary Care Specialties
MSR	Musculoskeletal Radiology	4	Hospital Based Specialties
N	Neurology	5	Other Specialties
NEP	Nephrology	2	Medical Subspecialties
NM	Nuclear Medicine	4	Hospital Based Specialties
NMN	Neuromuscular Medicine	5	Other Specialties
NO	Neurotology (Otolaryngology)	3	Surgical Subspecialties
NP	Neuropathology	4	Hospital Based Specialties
NPM	Neonatal-Perinatal Medicine	1	Primary Care Specialties
NR	Nuclear Radiology	4	Hospital Based Specialties
NRN	Neurology/diagnostic Radiology/Neuroradiology	5	Other Specialties
NS	Neurological Surgery	3	Surgical Subspecialties
NTR	Nutrition	2	Medical Subspecialties
NUP	Neuropsychiatry	5	Other Specialties
OAN	Obstetric Anesthesiology	4	Hospital Based Specialties
OAR	Orthopedic Adult Recon Surgery	3	Surgical Subspecialties
OBG	Obstetrics & Gynecology	1	Primary Care Specialties
OBS	Obstetrics	1	Primary Care Specialties
OFA	Orthopedics (foot & Ankle)	3	Surgical Subspecialties
OM	Occupational Medicine	5	Other Specialties
OMF	Oral And Maxillofacial Surgery	3	Surgical Subspecialties
OMM	Osteopathic Manipulative Medicine	5	Other Specialties
OMO	Orthopedic Musculo Oncology	2	Medical Subspecialties
ON	Oncology	2	Medical Subspecialties
OP	Orthopedic Pediatric Surgery	3	Surgical Subspecialties
OPH	Ophthalmology	3	Surgical Subspecialties
OPR	Ophthalmic Plastic and Reconstructive Surgery	3	Surgical Subspecialties
ORS	Orthopedic Surgery	3	Surgical Subspecialties
OS	Other Specialty	5	Other Specialties
OSM	Orthopedic Sports Medicine	3	Surgical Subspecialties
OSS	Orthopaedic Surgery Of Spine	3	Surgical Subspecialties
OTO	Otolaryngology	3	Surgical Subspecialties
OTR	Orthopedic Surgery - Trauma	3	Surgical Subspecialties
P	Psychiatry	5	Other Specialties
PAN	Pediatric Anesthesiology	1	Primary Care Specialties
PCC	Pulmonary Critical Care Med.	2	Medical Subspecialties
PCP	Pathology - Cytopathology	4	Hospital Based Specialties
PD	Pediatrics	1	Primary Care Specialties
PDA	Pediatric Allergy	1	Primary Care Specialties

AMA Specialty Code	AMA Specialty Text	5-Category Code	5-Category Text
PDC	Pediatric Cardiology	2	Medical Subspecialties
PDE	Pediatric Endocrinology	1	Primary Care Specialties
PDI	Pediatric Infectious Diseases	1	Primary Care Specialties
PDO	Pediatric Otolaryngology	3	Surgical Subspecialties
PDP	Pediatric Pulmonology	1	Primary Care Specialties
PDR	Pediatric Radiology	4	Hospital Based Specialties
PDS	Pediatric Surgery	3	Surgical Subspecialties
PE	Pediatric Emergency Medicine-EM	1	Primary Care Specialties
PEM	Pediatric Emergency Medicine	1	Primary Care Specialties
PFP	Forensic Psychiatry	5	Other Specialties
PG	Pediatric Gastroenterology	1	Primary Care Specialties
PHL	Phlebology	2	Medical Subspecialties
PHM	Pharmaceutical Medicine	5	Other Specialties
PHO	Pediatric Hematology Oncology	1	Primary Care Specialties
PHP	Public Health/genl Prevent Med	5	Other Specialties
PM	Physical Medicine & Rehab	5	Other Specialties
PME	Pain Management	4	Hospital Based Specialties
PMM	Pain Medicine	5	Other Specialties
PMP	Pediatrics - Physical Med And Rehab	5	Other Specialties
PN	Pediatric Nephrology	1	Primary Care Specialties
PO	Ophthalmology/pediatrics	3	Surgical Subspecialties
PP	Pediatric Pathology	4	Hospital Based Specialties
PPR	Pediatric Rheumatology	1	Primary Care Specialties
PRD	Procedural Dermatology	2	Medical Subspecialties
PRS	Sports Medicine (Physical Medicine & Rehab)	5	Other Specialties
PS	Plastic Surgery	3	Surgical Subspecialties
PSM	Pediatric Sports Medicine	1	Primary Care Specialties
PTH	Pathology - Anatomic/clinical	4	Hospital Based Specialties
PUD	Pulmonary Disease	2	Medical Subspecialties
PYA	Psychoanalysis	5	Other Specialties
PYG	Geriatric Psychiatry	1	Primary Care Specialties
PYM	Psychosomatic Medicine	5	Other Specialties
R	Radiology	4	Hospital Based Specialties
REN	Reproductive Endocrinology	1	Primary Care Specialties
RHU	Rheumatology	2	Medical Subspecialties
RNR	Neuroradiology	4	Hospital Based Specialties
RO	Radiation Oncology	4	Hospital Based Specialties
RPM	Pediatric Rehab Medicine	1	Primary Care Specialties
SCI	Spinal Cord Injury	3	Surgical Subspecialties

AMA Specialty Code	AMA Specialty Text	5-Category Code	5-Category Text
SME	Sleep Medicine	5	Other Specialties
SO	Surgical Oncology	3	Surgical Subspecialties
SP	Selective Pathology	4	Hospital Based Specialties
TRS	Traumatic Surgery	3	Surgical Subspecialties
TS	Thoracic Surgery	3	Surgical Subspecialties
TTS	Transplant Surgery	3	Surgical Subspecialties
U	Urological Surgery	3	Surgical Subspecialties
UCM	Urgent Care Medicine	5	Other Specialties
UP	Pediatric Urology	3	Surgical Subspecialties
US	Unspecified Specialty	5	Other Specialties
VIR	Vascular & Interventional Rad	4	Hospital Based Specialties
VN	Vascular Neurology	5	Other Specialties
VS	Vascular Surgery	3	Surgical Subspecialties

Appendix C: Lab Survey Cover Letter, Questionnaire

State of New Jersey
DEPARTMENT OF HEALTH
PO BOX 360
TRENTON, N.J. 08625-0360
www.nj.gov/health

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

MARY E. O'DOWD, M.P.H.
Commissioner

Dear _____,

The New Jersey Department of Health is actively working to help healthcare providers adopt and demonstrate the "meaningful use" of electronic health record (EHR) systems. The Department of Health has partnered with Rutgers Center for State Health Policy (CSHP) to better understand health information technology (health IT) adoption and health information exchange activity in the State. Rutgers CSHP is conducting a short mail survey of New Jersey-based clinical laboratories in order to assess the current capacity among the State's laboratories to receive and transmit health data in an electronic format. This survey can be completed by you or a staff member familiar with your laboratory information systems.

This survey is confidential. The information collected is stored on a secure server and access to it is limited to CSHP research staff and the Institutional Review Board at Rutgers. You as an individual will not be linked to any reports using the data; only information for groups of people will be reported. The survey will take about 10 minutes. Your participation is voluntary and attaches no foreseeable risks or benefits to you personally. You may choose not to answer any questions with which you are not comfortable.

Your feedback is vital to understanding the barriers and benefits to HIT implementation in the state of New Jersey. We thank you in advance for your time and input. Your response by _____ would be greatly appreciated. A prepaid, addressed envelope is enclosed for your convenience.

Sincerely,

Eileen Troutman
Acting New Jersey Health IT Coordinator

This informed consent form was approved by the Rutgers University Institutional Review Board for the Protection of Human Subjects on 8-13-2013: approval of this form expires on 4-25-2014.

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Susan Brownlee, Rutgers Center for State Health Policy: Tel: 848-932-4666, Email: sbrownlee@ifh.rutgers.edu

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Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs, 3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 848-932-0150, Email: humansubjects@orsp.rutgers.edu

New Jersey *Clinical Laboratory* Health Information Technology (HIT) Evaluation

NJ Health New Jersey Department of Health

RUTGERS Center for State Health Policy

Complete by the staff person most knowledgeable about your laboratory information systems

MARKING INSTRUCTIONS: *Correct Mark* ☒

Section A: Methods Used to Receive Laboratory Orders

1. Are healthcare providers able to order lab tests from this laboratory electronically using an electronic order message from an electronic health record (EHR) or computerized provider order entry (CPOE) system?

◯ **YES** ▼

a1. Of all providers submitting lab orders to this lab, what is the approximate percentage who submit them via electronic messages?

_____ % of providers

a2. How does this clinical laboratory accept electronic lab orders from healthcare providers? (*mark all that apply*)

- ☐ Office EHR System
- ☐ E-mail
- ☐ External Web Portal
- ☐ Other (*please specify*) _____

a3. What electronic standard(s) does this lab use for lab orders? (*mark all that apply*)

- ☐ LOINC (Logical Observation Identifiers Names and Codes)
- ☐ SNOMED-CT (Systematized Nomenclature of Medicine – Clinical Terms)
- ☐ HL7 v2.3.1
- ☐ HL7 v2.5.1
- ☐ HL7 v3
- ☐ Other (*please specify*) _____

◯ **NO** ▼

b1. How does this clinical laboratory accept lab orders from healthcare providers? (*mark all that apply*)

- ☐ Mail
- ☐ Fax
- ☐ In person
- ☐ Other (*please specify*) _____

b2. What are the major barriers to adopting electronic lab order messages for this lab? (*mark all that apply*)

- ☐ No currently available systems that satisfy the lab's needs
- ☐ Product installation and ongoing operational costs
- ☐ Decreased productivity during implementation
- ☐ Too few healthcare providers with EHR or CPOE capabilities
- ☐ Limited IT staff to support an electronic message ordering system
- ☐ Limited use of uniform standards for lab order terminology standards
- ☐ Other (*please specify*) _____

b3. When does this lab plan to implement electronic lab orders placed by an EHR or CPOE system? (*mark one*)

- ◯ In the next 6 months
- ◯ In the next 1 year
- ◯ In the next 2 years
- ◯ More than 2 years
- ◯ No plans to implement in future
- ◯ Other (*please specify*) _____

2. For each outcome listed below, indicate whether you think the impact of *electronic lab order entry* <u>is or would be</u> positive, negative, or no impact: (*mark one per row*)

	Very Positive	Somewhat Positive	No Impact	Somewhat Negative	Very Negative
a) Workflow efficiency	◯	◯	◯	◯	◯
b) Patient safety	◯	◯	◯	◯	◯
c) Overall healthcare costs	◯	◯	◯	◯	◯
d) Report accuracy	◯	◯	◯	◯	◯
e) Information availability	◯	◯	◯	◯	◯
f) Care coordination	◯	◯	◯	◯	◯
g) Patient satisfaction	◯	◯	◯	◯	◯

Section B: Methods Used to Send Laboratory Results to Health Care Providers

3. Is the laboratory capable of sending test results electronically in a structured format to an ordering health care provider?

○ **YES** ▼

a1. How does your laboratory share test results <u>electronically</u> with <u>ordering practitioners</u>? (*mark all that apply*)

- ☐ Web portal provided by your laboratory
- ☐ Web portal provided by a third party
- ☐ Third party middleware vendor
- ☐ Interface to health information organization
- ☐ Interface to Electronic Health Records (EHRs)
- ☐ Other (*please specify*) _____

a2. For electronic reporting of lab results, what electronic standard(s) does this lab use? (*mark all that apply*)

- ☐ LOINC (Logical Observation Identifiers Names and Codes)
- ☐ SNOMED-CT (Systematized Nomenclature of Medicine – Clinical Terms)
- ☐ HL7 v2.3.1
- ☐ HL7 v2.5.1
- ☐ HL7 v3
- ☐ HHL7 CDA Document (Unstructured)
- ☐ HHL7 CDA Document (Structured)
- ☐ Other (*please specify*) _____

○ **NO** ▼

b1. Which of the following issues concerning <u>electronic delivery of laboratory test results in a structured format</u> is a barrier your laboratory is currently facing? (*mark one per row*)

	Not a Barrier	Minor Barrier	Major Barrier
a) EHR systems are unable to receive structured results	○	○	○
b) Insufficient information on exchange options available	○	○	○
c) Lack of harmonization of industry accepted standards	○	○	○
d) Inability of Laboratory Information System (LIS) to generate/receive electronic messages/transactions in structured and standardized format	○	○	○
e) Subscription rates/fees for exchange service providers (including lab hub, third party middleware vendor, and Health Information Exchange providers) are too high	○	○	○
f) Compliance with Clinical Lab Improvement Amendments (CLIA) regulations	○	○	○
g) The time required to build interfaces	○	○	○
h) Other (*please specify*) _____	○	○	○

b2. When does this lab plan to implement electronic delivery of laboratory test results in a structured format? (*mark one*)

- ○ In the next 6 months
- ○ In the next 1 year
- ○ In the next 2 years
- ○ More than 2 years
- ○ No plans to implement in future
- ○ Other (*please specify*) _____

4. For each outcome listed below, indicate whether you think the impact of *electronic lab results* <u>is or would be</u> positive, negative, or no impact: (*mark one per row*)

	Very Positive	Somewhat Positive	No Impact	Somewhat Negative	Very Negative
a) Workflow efficiency	○	○	○	○	○
b) Patient safety	○	○	○	○	○
c) Overall healthcare costs	○	○	○	○	○
d) Report accuracy	○	○	○	○	○
e) Information availability	○	○	○	○	○
f) Care coordination	○	○	○	○	○
g) Patient satisfaction	○	○	○	○	○

Section C: Methods Used to Send Laboratory Results to NJ Department of Health (DOH)

5. Does this lab send reportable lab results to NJ DOH using an electronic message or document exchange?

◯ **YES** ▼

a1. For any electronic reporting of lab results, what electronic standard(s) is this lab capable of using? (*mark all that apply*)

- ☐ LOINC (Logical Observation Identifiers Names and Codes)
- ☐ SNOMED-CT (Systematized Nomenclature of Medicine – Clinical Terms)
- ☐ HL7 v2.3.1
- ☐ HL7 v2.5.1
- ☐ HL7 v3
- ☐ HL7 CDA Document (Unstructured)
- ☐ HL7 CDA Document (Structured)
- ☐ Data entry into DOH Registry
- ☐ Other (*please specify*) _____

◯ **NO** ▼

b1. When does this lab plan to implement electronic reporting to NJ DOH? (*mark one*)

- ◯ Not applicable (this lab does not perform reportable tests)
- ◯ In the next 6 months
- ◯ In the next 1 year
- ◯ In the next 2 years
- ◯ More than 2 years
- ◯ No plans to implement electronic reporting to NJ DOH
- ◯ Other (*please specify*) _____

Section D: Methods Used to Send Laboratory Results to Patients

6. Does your laboratory allow patients or their legal representatives direct access to their laboratory results?

◯ Yes ◯ No (*if No, go to Section E*)

a1. If YES, please indicate which of the following methods of delivery your laboratory uses to deliver results directly to patients or patients' legal representatives: (*mark all that apply*)

- ☐ Mail
- ☐ Fax
- ☐ Web portal solution provided by laboratory
- ☐ Transmission of results to a designated Personal Health Record (PHR)
- ☐ Through a community Health Information Organization (HIO) that provides patient access to information
- ☐ Through a physician's EHR that provides patient access

Section E: Health Information Exchange with Health Information Organizations (HIOs)

7. Is this lab sharing structured lab data electronically with any Health Information Organization (HIO) in New Jersey?

◯ Yes ◯ No (*if No, go to Section F*)

a1. If YES, please indicate which of the following HIOs your laboratory shares structured lab data electronically with: (*mark all that apply*)

- ☐ Camden Coalition
- ☐ Health-e-cITi-NJ
- ☐ Jersey Health Connect
- ☐ NJSHINE
- ☐ Trenton HIE
- ☐ Virtua
- ☐ Other (*please specify*) _____

Section F: General Information

8. What is your job title?

- ◯ Laboratory Director
- ◯ Laboratory Manager
- ◯ Laboratory Information Systems Director
- ◯ Medical Laboratory Technician or Clinical Laboratory Technician
- ◯ Medical Technologist or Clinical Laboratory Scientist
- ◯ Staff Pathologist
- ◯ Chief Information Officer
- ◯ Other (*please specify*) _____

9. How many full time equivalents (FTEs) currently work *only* in the laboratory? This would not include administrative and information technology staff who are shared with other parts of the facility. (*best estimate is fine*)

- ◯ None
- ◯ 1 to 5
- ◯ 6 to 10
- ◯ 11 to 15
- ◯ 16 to 30
- ◯ 31 to 45
- ◯ 46 to 60
- ◯ 61 or more: (*specify #*) _____

10. Which of the following most accurately describes this laboratory facility? (*mark one*)

- ◯ Commercial/Independent Lab
- ◯ Hospital Lab
- ◯ Public Health Facility
- ◯ Other (*please specify*) _____

11. Approximately how many total test results did your laboratory send to ordering practitioners during 2012? By test results we mean a laboratory test that is (1) ordered by an authorized healthcare provider; (2) performed on received specimens; and (3) finalized and results have been produced; e.g., a Complete Blood Count (CBC), not its component parts, should be counted as a single test result (*Please consult your records to answer this question. If records are not available, please provide your best estimate.*)

Number of **total** test results sent in 2012: _____

12. Which Laboratory Information System (LIS) technology related skills and/or roles are in greatest need within your lab? This includes adding new staff or developing the current staff. (*mark all that apply*)

- ☐ A person to lead the implementation/upgrade of the LIS
- ☐ People to help design, customize, and/or maintain an LIS for use in our clinical laboratory
- ☐ People to help modernize an existing LIS to enable standards-based exchange of electronic orders and results delivery
- ☐ People to map test names and test results to LOINC and SNOMED codes
- ☐ Computer/IT personnel
- ☐ Laboratory persons who bridge knowledge between IT and lab (laboratory informaticians)
- ☐ People to train staff on how to use the LIS
- ☐ Other (*please specify*) _____
- ☐ No workforce issues

Thank you. *Please return in the enclosed stamped, addressed envelope or mail to:*

NJ Health
New Jersey Department of Health

RUTGERS
Center for State Health Policy

Appendix D: HIO Survey Advance Letter, Questionnaire

State of New Jersey
DEPARTMENT OF HEALTH
PO BOX 360
TRENTON, N.J. 08625-0360
www.nj.gov/health

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

MARY E. O'DOWD, M.P.H.
Commissioner

Dear _____,

Recently you completed a physician mail survey from the New Jersey Department of Health (DOH) about your experience with health information technology (HIT) such as EHR systems, e-prescribing, electronic lab orders, electronic patient care summaries, and participation in regional health information organizations (HIOs). Thank you for completing the survey. The data you provided will be invaluable for understanding HIT adoption and health information exchange activity in the State. As mentioned earlier, DOH has partnered with Rutgers Center for State Health Policy (CSHP) to evaluate three key meaningful-use criteria: (1) e-prescribing by pharmacies and providers, (2) use of electronic lab results by clinical laboratories and providers, and (3) provider use of patient care summaries and participation in regional HIOs. CSHP is now preparing for the evaluation of provider participation in regional HIOs and will be conducting a short semi structured follow-up phone interview of New Jersey physicians in order to understand your experience with participation in regional HIOs.

You have been randomly selected for this interview. You indicated on the survey that you participate in one or more regional HIOs in NJ. This interview is confidential. The information collected is stored on a secure server with access limited to CSHP research staff and the Institutional Review Board at Rutgers. You as an individual will not be linked to any reports using the data; only information for groups of people will be reported. The interview will take about 15 minutes. Your participation is voluntary and has no foreseeable risks or benefits to you personally. You may choose not to answer any questions with which you are not comfortable.

Your feedback is vital to understanding the barriers and benefits of HIT implementation in the state of New Jersey. We thank you in advance for your time and input. In the near future, we will be contacting you to set up an appointment for this phone interview.

Sincerely,

(Insert sig)
Eileen Troutman
Acting New Jersey Health IT Coordinator

If you have questions about this interview, please contact:
Manisha Agrawal, Rutgers Center for State Health Policy: Tel: 848-932-4631, Email: magrawal@ifh.rutgers.edu
If you have questions about your rights as a research subject, you may contact the Rutgers IRB Administrator at:
Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs, 3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 848-932-0150, Email: humansubjects@orsp.rutgers.edu

Semi Structured Phone Interview: Physician Participation in HIOs

Before we begin, I would like to share some definitions with you:
A Health Information Organization or HIO is an organization that enables the electronic sharing of information among providers. The HIOs allow health data to be gathered confidentially and securely from the patient's providers, and then shared confidentially and securely among physicians and hospitals within the HIO's region for the benefit of the patient. There are six regional HIOs in NJ – Camden Coalition, Health-e-cITi-NJ, Jersey Health Connect, NJSHINE, Trenton HIE, and Virtua.

An Electronic Health Record, known as an EHR and sometimes called an EMR or electronic medical record, is a computerized version of a paper chart that contains all of a patient's medical history from one practice.

(Confirm response to question 13 on provider survey:)
You completed a mail survey that we sent 2-3 months ago. On that survey, you indicated that you exchange information with (HIO name). Is that correct? ☐Yes ☐No ***(If no, switch to non-users interview)***

Que1. Were you aware of what an HIO does before I just described it to you? ☐ Yes ☐ No
(If no, go to Que 4)

Que 1a. Do you know who funds HIOs in New Jersey? ☐ Yes ☐ No

Que 1b. ***(If yes)*** Who:
- ☐ State government
- ☐ Federal government
- ☐ Hospitals
- ☐ User fees
- ☐ Private funding
- ☐ Other? _____

Que 2. I am going to read you a list of sources of information and let me know for each one if you received any information about HIOs from them:

Hospitals	☐ Yes	☐No
Directly from an HIO	☐ Yes	☐No
Regional Extension Centers such as NJ-HITEC	☐ Yes	☐No
State HIT Coordinator's Office	☐ Yes	☐No
Other state government	☐ Yes	☐No
Federal government	☐ Yes	☐No
Other physicians	☐ Yes	☐No
News/Media	☐ Yes	☐No
EHR system vendor or other IT company	☐ Yes	☐No
Anything else?_____	☐ Yes	☐No

Que 3. What is your level of understanding of how HIO data exchange works? Would you say it is:

□ None □ Low □ Moderate □ High level of understanding

Que 4. I am going to read you a list of information available from an HIO. For each, please tell me if you receive it and how useful it is for you.

	Receive Information	**Usefulness "Would you say…"**			
	Yes/No	Very useful	Somewhat useful	A little useful	Not at all useful
a) Physician notes	□Yes □No	□	□	□	□
b) Clinical summaries	□Yes □No				
c) Reports	□Yes □No	□	□	□	□
d) Laboratory results (e.g., microbiology and pathology)	□Yes □No	□	□	□	□
e) Radiology results (without images)	□Yes □No	□	□	□	□
f) Radiology images	□Yes □No	□	□	□	□
g) Cardiology results	□Yes □No	□	□	□	□
h) EKG images	□Yes □No	□	□	□	□
i) Problem list with diagnosis code	□Yes □No	□	□	□	□
j) All medications prescribed	□Yes □No	□	□	□	□
k) All medications filled	□Yes □No	□	□	□	□
l) Allergy information	□Yes □No	□	□	□	□
m) Hospital discharge summary	□Yes □No	□	□	□	□
n) Advanced directives (i.e. health care proxy, living will, DNR)	□Yes □No	□	□	□	□

Que 5. Are you accessing an HIO for reasons other than for accessing patient information?

□ Yes □ No (if no, go to question 6)

Que 5a. If yes, what are you accessing?

_____

_____

Que 6. What other services or information would you like to get from an HIO in the future?

_____

_____

_____

_____

_____

Que 7. Describe your practice's decision-making process as you weighed the pros and cons of participation in an HIO? (What factors determined the decision to participate and what were the concerns).

Que 8. Please rate the level of satisfaction you have from sharing health information with your HIOs and other providers. Would you say you are?

- □ Very satisfied
- □ Somewhat satisfied
- □ Somewhat dissatisfied
- □ Very dissatisfied

Que 8a. Can you tell us more about why you are *(satisfied/dissatisfied)* with your participation in an HIO?

_____
_____
_____

Que 8b. How easy or difficult is it for you to access information from an HIO?

- □ Very easy
- □ Somewhat easy
- □ Somewhat difficult
- □ Very difficult

Que 8c. How easy or difficult is it for you to integrate information from an HIO into your workflow?

- □ Very easy
- □ Somewhat easy
- □ Somewhat difficult
- □ Very difficult

Que 8d. Do you access patient information from your HIO ***(read choices):***

Before seeing the patient	□ Yes	□ No
During the visit	□ Yes	□ No
After the visit	□ Yes	□ No

Que 9. Does the electronic sharing of information via an HIO have a "positive," "negative" or "no effect" for each of the following?

"Would you say…"	**Very positive**	**Somewhat positive**	**No effect**	**Somewhat negative**	**Very negative**
Completeness and accuracy of patients health record	□	□	□	□	□
Efficiency with which clinical care is delivered in your practice	□	□	□	□	□
Quality of care	□	□	□	□	□
Patient safety	□	□	□	□	□
Privacy and security of patient health information	□	□	□	□	□
Communication with other providers	□	□	□	□	□
Care coordination	□	□	□	□	□
Continuity of care	□	□	□	□	□
Patient satisfaction	□	□	□	□	□
Productivity	□	□	□	□	□
Healthcare costs	□	□	□	□	□
Is there anything else? _____	□	□	□	□	□

Que 10. What is the most important reason you joined an HIO? ***(Don't read the list. Mark all responses that apply.)***

To help demonstrate "Meaningful Use" so as to receive federal incentive	□
Completeness and accuracy of patients health record	□
Efficiency with which clinical care is delivered in your practice	□
Quality of care	□
Patient safety	□
Privacy and security of patient health information	□
Communication with other providers	□
Care coordination	□
Continuity of care	□
Patient satisfaction	□
Productivity	□
Healthcare costs	□
Is there anything else? _____	□

Que 11. Are you concerned about the privacy and security of sharing patient information through an HIO? □ Yes □ No

Que 11a. ***(If yes)***, what are your concerns?

_____

_____

_____

Que 12. Do you have any concerns about HIO participation either now or in the future?

□ Yes □ No

Que 12a. ***(If yes)***, explain.

_____

_____

_____

Que 13. Do you envision any future situations that might lead you to stop participating?

□ Yes □ No

Que 13a. ***(If yes)***, explain.

_____

_____

Que 14. How much of a barrier is each of the following to your current or continued participation in an HIO?

"Would you say…"	**Not a barrier**	**Minor barrier**	**Major barrier**
Start-up financial costs	□	□	□
Ongoing financial costs	□	□	□
The financial return on investment or ROI	□	□	□
Personnel and /or time to select and implement the HIO system	□	□	□
Support from vendors for upgrading/maintaining the HIO system	□	□	□
Training time, productivity loss	□	□	□
Attitudes of you (or other physicians in your practice) about using HealthIT in your practice	□	□	□
Privacy and security concerns	□	□	□
Obtaining and updating patient consent	□	□	□
Computer skills of you/staff	□	□	□
Computer technical support	□	□	□
Lack of time to acquire knowledge about HIO systems	□	□	□
Lack of uniform standards within the industry (multiple systems)	□	□	□
Low participation by area physicians and other providers	□	□	□
Any other major or minor barrier?_____	□	□	□

Que 15. How does your practice plan to sustain HIO participation in the future?

_____
_____
_____

Que 16. Have you discussed your decision to participate in an HIO with other providers not participating in an HIO? □ Yes □ No

Que16a. What advice about participation in HIOs you have for other providers who are currently not participating?

_____
_____
_____

Que 17. What can the State of New Jersey do to encourage more physician participation in HIOs?

_____
_____
_____

Que 18. How do your patients feel about your participation in an HIO?

_____
_____
_____

Okay, that is all the questions we have today. Thank you so much for providing feedback. Your participation will help New Jersey improve HIO participation. Goodbye.

State of New Jersey
DEPARTMENT OF HEALTH
PO BOX 360
TRENTON, N.J. 08625-0360
www.nj.gov/health

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

MARY E. O'DOWD, M.P.H.
Commissioner

Dear _____,

Recently you completed a physician mail survey from the New Jersey Department of Health (DOH) about your experience with health information technology (HIT) such as EHR systems, e-prescribing, electronic lab orders, electronic patient care summaries, and participation in regional health information organizations (HIOs). Thank you for completing the survey. The data you provided will be invaluable for understanding HIT adoption and health information exchange activity in the State. As mentioned earlier, DOH has partnered with Rutgers Center for State Health Policy (CSHP) to evaluate three key meaningful-use criteria: (1) e-prescribing by pharmacies and providers, (2) use of electronic lab results by clinical laboratories and providers, and (3) provider use of patient care summaries and participation in regional HIOs (organization that provides services to enable the electronic sharing of health-related information among healthcare providers). CSHP is now preparing for the evaluation of provider participation in regional HIOs and will be conducting a short semi structured follow-up phone interview of New Jersey physicians not participating in HIOs in order to understand barriers to participation and future plans.

You have been randomly selected for this interview. You indicated on the survey that you are not participating in regional HIOs in NJ. This interview is confidential. The information collected is stored on a secure server with access limited to CSHP research staff and the Institutional Review Board at Rutgers. You as an individual will not be linked to any reports using the data; only information for groups of people will be reported. The interview will take about 15 minutes. Your participation is voluntary and has no foreseeable risks or benefits to you personally. You may choose not to answer any questions with which you are not comfortable.

Your feedback is vital to understanding the barriers and benefits to HIT implementation in the state of New Jersey. We thank you in advance for your time and input. In the near future, we will be contacting you to set up an appointment for this phone interview.

Sincerely,
(Insert sig)
Eileen Troutman
Acting New Jersey Health IT Coordinator

If you have questions about this interview, please contact:
Manisha Agrawal, Rutgers Center for State Health Policy: Tel: 848-932-4631, Email: magrawal@ifh.rutgers.edu
If you have questions about your rights as a research subject, you may contact the Rutgers IRB Administrator at:
Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs, 3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 848-932-0150, Email: humansubjects@orsp.rutgers.edu

Semi Structured Phone Interview: Physician Non-Participation in HIOs

Before we begin, I would like to share some definitions with you:
A Health Information Organization or HIO is an organization that enables the electronic sharing of information among providers. The HIOs allow health data to be gathered confidentially and securely from the patient's providers, and then shared confidentially and securely among physicians, hospitals within the HIO's region for the benefit of the patient. There are six regional HIOs in NJ – Camden Coalition, Health-e-cITi-NJ, Jersey Health Connect, NJSHINE, Trenton HIE, and Virtua.

An Electronic Health Record, known as an EHR and sometimes called an EMR or electronic medical record, is a computerized version of a paper chart that contains all of a patient's medical history from one practice.

(Confirm response to question 13 on provider survey:)
You completed a mail survey that we sent 2-3 months ago. On that survey, you indicated that that you do not exchange information with an HIO. Is that correct? ☐Yes ☐No ***(If no, switch to users interview)***

Que1. Were you aware of what an HIO does before I just described it to you? ☐ Yes ☐ No
(If no, go to Que 4)

Que 1a. Do you know who funds HIOs in New Jersey?
☐ Yes ☐ No

Que 1b. ***(If yes)*** Who:
☐ State government
☐ Federal government
☐ Hospitals
☐ User fees
☐ Private funding
☐ Other_____

Que 2. I am going to read you a list of sources of information and let me know for each one if you received any information about HIOs from them:

Hospitals	☐ Yes	☐No
Directly from an HIO	☐ Yes	☐No
Regional Extension Centers such as NJ-HITEC	☐ Yes	☐No
State HIT Coordinator's Office	☐ Yes	☐No
Other state government	☐ Yes	☐No
Federal government	☐ Yes	☐No
Other physicians	☐ Yes	☐No
News/Media	☐ Yes	☐No
EHR system vendor or other IT company	☐ Yes	☐No
Anything else?_____	☐ Yes	☐No

Que 3. What is your level of understanding of how HIO data exchange works? Would you say it is:

None Low Moderate High level of understanding

Que 4. Describe your practice's decision-making process as you weighed the pros and cons of non-participation in an HIO? (What factors determined the decision to not participate and what were the concerns).

_____
_____
_____
_____

Que 5. Are you aware of an HIO in your area?

□ Yes □ No

Que 5a. If yes, which one? _____

Que 6. How interested are you in joining a New Jersey regional HIO?

□ Very interested
□ Moderately interested
□ A little interested
□ Not at all interested

Que6a. When do you plan to start participating?

□ 2014 □ 2015 □ 2016 □ After 2016

Que 7. How easy or difficult would it be for you to use new health information technology such as an EHR?

□ Very easy
□ Somewhat easy
□ Somewhat difficult
□ Very difficult

Que 8. Does the electronic sharing of information via an HIO have a "positive," "negative" or "no effect" for each of the following?

"Would you say…"	**Very positive**	**Somewhat positive**	**No effect**	**Somewhat negative**	**Very negative**
Completeness and accuracy of patients health record	□	□	□	□	□
Efficiency with which clinical care is delivered in your practice	□	□	□	□	□
Quality of care	□	□	□	□	□
Patient safety	□	□	□	□	□
Privacy and security of patient health information	□	□	□	□	□
Communication with other providers	□	□	□	□	□
Care coordination	□	□	□	□	□
Continuity of care	□	□	□	□	□
Patient satisfaction	□	□	□	□	□
Productivity	□	□	□	□	□
Healthcare costs	□	□	□	□	□
Is there anything else? _____	□	□	□	□	□

Que 9. Do you plan to start participating in an HIO? How much of a barrier is each of the following to beginning your participation in an HIO?

"Would you say…."	**Not a barrier**	**Minor barrier**	**Major barrier**
Start-up financial costs	□	□	□
Ongoing financial costs	□	□	□
The financial return on investment or ROI	□	□	□
Personnel and /or time to select and implement the HIO system	□	□	□
Support from vendors for upgrading and maintaining the HIO system	□	□	□
Training time, productivity loss	□	□	□
Attitudes of you (or other physicians in your practice) about using HealthIT in your practice	□	□	□
Privacy and security concerns	□	□	□
Obtaining and updating patient consent	□	□	□
Computer skills of you/staff	□	□	□
Computer technical support	□	□	□
Lack of time to acquire knowledge about HIO systems	□	□	□
Lack of uniform standards within the industry (multiple systems)	□	□	□
Low participation by area physicians and other providers	□	□	□
Any other major or minor barrier?_____	□	□	□

Que 10a. What is the biggest reason you do not participate in an HIO?

_____
_____
_____

Que 10b. What is the 2nd biggest reason you don't participate?

_____
_____
_____

Que11. Have any of your patients asked why you don't participate in an HIO?

□ Yes □ No

Que 11a. ***(If yes)*** Could you please explain some of their concerns?

_____
_____
_____

Que 12. What can the State of New Jersey do to encourage physician participation in HIOs?

_____
_____
_____
_____

Que 13. Now that you have decided to not participate, do you envision any future situations that might lead you to start participating?

□ Yes □ No

Que 13a. (***If yes)*** explain.

_____
_____
_____

Que14. Would you like to get contact info for an HIO in your area?

□ Yes ***(provide if yes)*** □ No

Okay, that is all the questions we have today. Thank you so much for providing feedback. Your participation will help New Jersey improve HIO participation. Goodbye.

Appendix E: Clinical Summary Survey Advance Letter, Questionnaire

State of New Jersey
DEPARTMENT OF HEALTH
PO BOX 360
TRENTON, N.J. 08625-0360
www.nj.gov/health

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

MARY E. O'DOWD, M.P.H.
Commissioner

Dear ,

Recently you completed a physician mail survey from the New Jersey Department of Health (DOH) about your experience with health information technology (HIT) such as electronic health record (EHR) systems and e-prescribing. Thank you for completing the survey. The data you provided will be invaluable for understanding HIT adoption and health information exchange activity in the State. As mentioned earlier, DOH has partnered with Rutgers Center for State Health Policy (CSHP) to evaluate three key meaningful-use criteria: (1) e-prescribing by pharmacies and providers, (2) use of electronic lab results by clinical laboratories and providers, and (3) provider use of patient care summaries and participation in regional HIOs (organizations that provide services to enable electronic sharing of health-related information among providers). CSHP is now preparing for the evaluation of providers' experiences with electronic patient care summaries, also known as clinical summaries, and will be conducting a short semi-structured follow-up phone interview of a sub-sample of New Jersey physicians who completed the earlier mail survey in order to understand barriers to the use of clinical summaries and future plans for implementing/maintaining.

You have been randomly selected for this phone interview. This interview is confidential. The information collected is stored on a secure server with access limited to CSHP research staff and the Institutional Review Board at Rutgers. You as an individual will not be linked to any reports using the data; only information for groups of people will be reported. The interview will take about 15 minutes. Your participation is voluntary and has no foreseeable risks or benefits to you personally. You may choose not to answer any questions with which you are not comfortable.

Your feedback is vital to understanding the barriers and benefits to HIT implementation in the state of New Jersey. We thank you in advance for your time and input. In the near future, we will be contacting you to set up an appointment for this phone interview.

Sincerely,

Eileen Troutman

Eileen Troutman
Acting New Jersey Health IT Coordinator

If you have questions about this interview, please contact:
Nirvana Petlick, Rutgers Center for State Health Policy: Tel: 848-932-4633, Email: npetlick@ifh.rutgers.edu
If you have questions about your rights as a research subject, you may contact the Rutgers IRB Administrator at:
Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs, 3 Rutgers Plaza, New Brunswick, NJ 08901-8559
Tel: 848-932-0150, Email: humansubjects@orsp.rutgers.edu

Semi-Structured Phone Interview:
Electronic Clinical Summaries (also known as patient care summaries)

Before we begin, I would like to share some definitions with you:

A clinical summary is an after-visit summary that provides the patient with information and instructions such as patient name, date of visit, updated medication list, updated vitals, reason(s) for visit, etc. This is generated from a computer database and can be shared with the patient online or it can be printed as a paper version.

An electronic health record, known as an EHR and sometimes called an EMR or electronic medical record, is a computerized version of a paper chart that contains all of a patient's medical history from one practice.

Clinical Summary Users (as indicated on physician mail survey)

(Confirm response to question 14b on provider survey.)
On the survey we sent you in October, you indicated that you provide clinical summaries to at least some patients. Is that correct? ☐Yes ☐No ***(If No, switch to non-users interview)***

1. In what year did you implement electronic clinical summaries? Year:_____ (best estimate is fine)

2. How adept are you at using electronic clinical summaries? Would you say…
   - ☐ Not at all,
   - ☐ Somewhat, or
   - ☐ Very adept?

3. How aware are you of the Stage 1 Meaningful Use criteria? Would you say…
   - ☐ Not at all,
   - ☐ Somewhat, or
   - ☐ Very aware?

4. How aware are you of the Stage 2 Meaningful Use criteria? Would you say…
   - ☐ Not at all,
   - ☐ Somewhat, or
   - ☐ Very aware?

5. In general, is information for your patient's clinical summary entered into your EHR during or after the visit?

   ☐ During the visit
   ☐ After the visit
      - [If after] How many days after the visit? _____ Days

6. In which of the following ways do you provide clinical summaries from your EHR to your patients?
   a. Patients are given a paper copy at the end of the visit? ☐Yes ☐No (If No, go to 6b)
      aa. What percentage of your patients are given a paper copy at the end of the visit? _____%
   b. Patients are mailed a paper copy? ☐Yes ☐No (If No, go to 6c)
      bb. What percentage of your patients are mailed a paper copy? _____%
   c. Patients are emailed? ☐Yes ☐No (If No, go to 6d)
      cc. What percentage of your patients are emailed? _____%
   d. Patients are provided with a CD or flash drive? ☐Yes ☐No (If No, go to 6e)
      dd. What percentage of your patients are provided with a CD or flash drive? _____%
   e. Patients are provided access to the patient portal (a patient portal is a secure website that gives patients access to personal health information)? ☐Yes ☐No (If No, go to 6f)
      ee. What percentage of your patients are provided access to the patient portal? _____%
   f. Patients view the clinical summary on a computer in your practice? ☐Yes ☐No (If No, go to 7)
      ff. What percentage of your patients view the clinical summary on a computer in your practice? _____%

7. What are some of the reasons that patients are not provided with a clinical summary? (check all that apply, do not read answer choices)

   ☐ Minor illness
   ☐ Mental Illness
   ☐ No illness
   ☐ Patient knew full details
   ☐ One time visit
   ☐ Practice does not push for clinical summaries
   ☐ Provider was not trained in use of clinical summaries
   ☐ Technical issues (computer was down)
   ☐ Language barrier
   ☐ Reading comprehension
   ☐ Vision impairment
   ☐ Any other reasons? (please specify)_____

8. Were any of the following workflow adjustments necessary to begin extracting clinical summaries from your EHR?

   (read each, check all that apply)

   - ☐ Short meeting with the care team (at the beginning of the day) to prepare for each patient
   - ☐ Pre-visit summary provided to patient
   - ☐ Gather and enter information into the EHR before the provider sees the patient
   - ☐ Provider enters information during the visit
   - ☐ Provider reviews clinical summary with the patient (electronically or on paper)
   - ☐ Train provider to instruct patients on use of patient portal
   - ☐ Anything else_____

9. I am going to read a list of fields that are often included on clinical summaries. Please tell me yes or no whether they are included on your patient's clinical summaries.

   - ☐ Patient name
   - ☐ Provider's office contact information
   - ☐ Date and location of visit
   - ☐ An updated medication list
   - ☐ Current medication allergy list
   - ☐ Medications administered during visit
   - ☐ Updated vitals
   - ☐ Reason(s) for visit
   - ☐ Procedures and other instructions based on clinical discussions that took place during the office visit
   - ☐ Any updates to a medical problem list
   - ☐ Summary of topics covered/considered during visit
   - ☐ Time and location of next appointment/testing if scheduled, or a recommended appointment time if not scheduled
   - ☐ List of other appointments and tests that the patient needs to schedule with contact information
   - ☐ Recommended patient decision aids
   - ☐ Laboratory and other diagnostic test orders or results
   - ☐ Symptoms

   Additional fields provided to when you transition patients to another setting of care or provider of care:

   - ☐ Encounter diagnosis
   - ☐ Smoking status
   - ☐ Functional status, including activities of daily living, cognitive and disability status
   - ☐ Demographic information (preferred language, sex, race, ethnicity, date of birth).

- ☐ Care plan field, including goals and instructions
- ☐ Care team including the primary care provider of record and any additional known care team members beyond the referring or transitioning provider and receiving provider.
- ☐ Reason for referral
- ☐ Problem List
- ☐ Allergy
- ☐ Care Plan

- ☐ Anything else?_____

10. How did your practice decide what to include in the clinical summary?
    (check all that apply)

- ☐ I decided (physician that we are calling)
- ☐ Clinical team in the practice
- ☐ IT staff in the practice
- ☐ Asked other physicians for advice
- ☐ Suggestions from vendor
- ☐ Anything else? _____

11. Which of the following elements did you consider in the design of the clinical summary?

- ☐ Formatting
- ☐ Highlighting certain categories
- ☐ Language
- ☐ Needs of the patient population
- ☐ Anything else?_____

12. How often do you exchange clinical summaries with other provides?

    Would you say…

- ☐ Never
- ☐ Rarely
- ☐ Sometimes
- ☐ Often
- ☐ Don't know
- ☐ Refused

(If more often than Never) Which of the following ways do you use to SEND clinical summaries to other providers?

a. Electronically directly from the office EHR? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries sent to other providers were sent electronically from the office EHR? _____%

b. Via email? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries sent to other providers were sent via email? _____%

c. Electronically from an external web portal? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries sent to other providers were sent electronically from an external web portal? _____%

d. Paper copy? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries sent to other providers use a paper copy? _____%

e. Another method? ☐Yes ☐No Specify method:_____

(if yes) About what percentage of the total clinical summaries sent to other providers use this method? _____%

Which of the following ways do you use to RECEIVE clinical summaries from other providers?

f. Electronically directly from an office EHR? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries received from other providers were sent electronically from the office EHR? _____%

g. Via email? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries received from other providers were sent via email? _____%

h. Electronically from an external web portal? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries received from other providers were sent electronically from an external web portal? _____%

i. Paper copy? ☐Yes ☐No

(if yes) About what percentage of the total clinical summaries received from other providers use a paper copy? _____%

j. Another method? ☐Yes ☐No Specify method:_____

(if yes) About what percentage of the total clinical summaries received from other providers use this method? _____%

13. Has electronic system compatibility been a problem when exchanging clinical summaries with other providers?

    Would you say this has been…

    ☐ A Major problem,
    ☐ A Minor problem, or
    ☐ Not a problem

    (If major or minor problem) Describe the problem.

    _____

    _____

14. a. What is the most important benefit of clinical summaries?

    _____

    _____

    _____

    _____

    b. What is the second most important benefit?

    _____

    _____

    _____

    _____

15. a. What is the biggest drawback to the use of electronic clinical summaries?

    _____

    _____

    _____

    _____

    b. What is the second biggest drawback?

    _____

    _____

    _____

    _____

16. Do you plan to:

- ☐ Increase,
- ☐ Decrease,
- ☐ Or Maintain

… your current level of electronic clinical summary use?

17. What advice do you have for practices who have not yet implemented clinical summaries?

_____

_____

_____

_____

18. Are you familiar with…[have description ready if no]
    a. NJ-HITEC ☐Yes ☐No
    b. (Are you familiar with) any of the 6 regional HIOs in New Jersey ☐Yes ☐No

19. What sources of information did you use to inform the implementation of electronic clinical summaries in your practice?

_____

_____

_____

_____

(Thank respondent for their time and end interview)

Semi-Structured Phone Interview:
Electronic Clinical Summaries (also known as patient care summaries)

Before we begin, I would like to share some definitions with you:

A clinical summary is an after-visit summary that provides the patient with information and instructions such as patient name, date of visit, updated medication list, updated vitals, reason(s) for visit, etc. This is generated from a computer database and can be shared with the patient online or it can be printed as a paper version.

An electronic health record, known as an EHR and sometimes called an EMR or electronic medical record, is a computerized version of a paper chart that contains all of a patient's medical history from one practice.

Clinical Summary Non-Users (as indicated on physician mail survey)

(Confirm response to question 14b on provider survey:)
On the survey we sent you in October, you indicated that you do not provide clinical summaries to any patients. Is that correct? ☐Yes ☐No ***(If Yes, switch to users interview)***

1. a. What is the main reason that your practice has not implemented electronic clinical summaries extracted from an EHR?

   _____
   _____
   _____
   _____

   b. What is the next most important reason?

   _____
   _____
   _____
   _____

2. How skilled are you in the use of electronic health records?

   - ☐ None
   - ☐ Low
   - ☐ Average
   - ☐ High

3. How skilled are you at using a computer?

   - ☐ None
   - ☐ Low
   - ☐ Average
   - ☐ High

4. Are there certain considerations regarding your patient population that affect your use of clinical summaries? What are they?

   - ☐ Minor illness
   - ☐ No illness
   - ☐ Patient knew full details
   - ☐ One time visit
   - ☐ Practice does not push for clinical summaries
   - ☐ Provider was not trained in use of clinical summaries
   - ☐ Technical issues (computer was down)
   - ☐ Language barrier
   - ☐ Reading comprehension
   - ☐ Vision impairment
   - ☐ Any other reasons? (please specify)_____

5. Do you plan to implement clinical summaries extracted from an EHR?

   ☐Yes ☐No

   (If Yes) When? (best estimate is fine)

   - ☐ 2014
   - ☐ 2015
   - ☐ 2016
   - ☐ 2017 or later

6. Are you familiar with…[have description ready if no]
   a. NJ-HITEC ☐Yes ☐No
   b. (Are you familiar with) any of the 6 regional HIOs in New Jersey ☐Yes ☐No

7. What sources of information have you received or reviewed regarding electronic clinical summaries and how to implement them in your practice?

(Thank respondent for their time and end interview)

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