

# **Manitoba's Physician Integrated Network (PIN) Initiative A Benefits Evaluation Report**

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## **ACKNOWLEDGEMENTS**

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## INTRODUCTION

This report summarizes findings from a series of evaluation activities pertaining to Manitoba's Physician Integrated Network (PIN) conducted for the purpose of understanding the benefits of electronic medical records (EMR) in supporting care provided by family medicine practices participating in the initiative.

The Physician Integrated Network (PIN) is a Manitoba Health primary care renewal initiative that engages fee-for-service physician groups and supports comprehensive, collaborative chronic disease management and preventive practice in primary care. Phase 1 of the PIN initiative began in 2006 with three demonstration sites and one control site. Manitoba Health expanded the demonstration by launching Phase 2 in September of 2008. During Phase 2, the number of Demonstration Sites grew from the original four sites to thirteen sites (65 physicians to 130 physicians). One Phase 2 site has subsequently not continued to participate. Both rural and urban settings are represented.

PIN has four primary objectives:

- To improve access to primary care
- To improve primary care providers' access to and use of information
- To improve the work life of all primary care providers
- To demonstrate high-quality primary care, with a specific focus on chronic disease

Participating PIN sites use electronic medical records (EMRs) and are able to track a range of primary care clinical process quality indicators. These indicators are largely derived and selected from evidence-based primary care indicators developed by the Canadian Institute for Health Information (CIHI). PIN indicators capture recommended screening and chronic disease management processes within six clusters:

- prevention
- diabetes management
- asthma management
- congestive heart failure management
- hypertension management
- coronary artery disease management

In addition to these, trial indicators for depression screening and patient access have been developed.

PIN is exploring the potential of blended funding in primary care. PIN sites receive Quality Based Incentive Funding (QBIF) – a Manitoba version of pay-for-performance – as one catalyst for practice and system change. Funding is determined based on the practice achieving targets on the above indicators. Additional components of the QBIF funding model that have evolved provide incentives for comprehensive management, and an increased focus on patients with multiple chronic conditions. QBIF provides PIN demonstration sites with the resources to implement practice changes, such as establishing inter-professional teams, to enhance patient care.

The use of electronic medical records in the day-to-day clinical management at the PIN sites assists physicians in not only better understanding their patient population through increased access to reports, but also in the delivery of care through the use of features such as automated reminders.

*Manitoba context – information technology use in primary care*

From results of the 2010 National Physician Survey, 49% of Manitoba family physicians reported using paper charts only, 17% used a combination of electronic and paper charts, and 24% used electronic records instead of paper charts. This compares to national rates of 41% using paper charts only, 27.5% using both, and 21.5% using electronic records.

34.6% of Manitoba family physicians reported using electronic records to enter and retrieve clinical patient notes and 28.5% reported using electronic reminders for recommended patient care. This compares to the national figures of 41.3% and 27.9%, respectively<sup>1</sup>.

In general, Manitoba lagged behind the majority of other provinces in Canada as of 2010 with respect to use of electronic medical records.

To be accepted to join the PIN initiative, group practices had to be using one of four provincially approved EMR systems. These approved systems allow for a level of standardization and functionality to support consistent data entry, decision support functions (e.g. electronic reminders) and regular data extractions, used to determine achievement on PIN indicators. A key enabling factor to meet the PIN objectives was optimization of the EMR usage to support the delivery of quality care.

The following clinics are participating Manitoba PIN sites:

- Agassiz Medical Centre (Morden)
- Altona Clinic (Altona)
- Assiniboine Clinic (Winnipeg)
- Centre Médical Seine Inc. (Ste. Anne)
- Clinique St. Boniface Clinic (Winnipeg)
- Concordia Health Associates (Winnipeg)
- Dr. C. W. Wiebe Medical Centre (Winkler)
- Prairie Trail Medical Clinic (Winnipeg)
- Steinbach Family Medical Centre (Steinbach)
- Tuxedo Family Medical Centre (Winnipeg)
- Virden Medical Associates (Virden)
- Western Medical Clinic (Brandon)

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<sup>1</sup> [http://www.nationalphysiciansurvey.ca/nps/2010\\_Survey/2010nps-e.asp](http://www.nationalphysiciansurvey.ca/nps/2010_Survey/2010nps-e.asp)

## **Scope and Purpose of this Report**

This report focuses primarily on the impacts of EMRs on care provided by family medicine practices participating in the PIN initiative. Through PIN, engaged clinics measure their performance against clinical process indicator targets that represent provider conformance with key clinical practice guidelines, as identified by the Canadian Institute for Health Information and other stakeholders. Automated prompting and regular performance reports are provided with the objective of improving access to and the use of information which guides practice and can motivate performance. The use of the EMR in tracking indicator target achievement and group achievement is an essential component to the PIN initiative. This report will assess the patient and health system benefits associated with any improvement in performance achievement, and provide insight into the impact of information supports on clinical process.

The following series of evaluation questions will be addressed:

### **Access**

- Does PIN increase access to care from primary care physicians?
- Does PIN increase access to care from other primary care providers?

### **Access to and use of information**

- How does PIN improve provider access to and use of information?
- What lessons about EMR implementation and use have been learned through the PIN initiative?

### **Quality**

- Does PIN increase provider access and adherence to evidence informed practice guidelines?
- Does PIN increase consistency and comprehensiveness of care of patients with chronic disease?
- Does PIN result in access to services/tests the patient would otherwise not have accessed?
- Does PIN improve patient perceptions of their care experience?

### **System Impact**

- What, if any, change has there been in the volume of laboratory tests ordered by PIN physicians (i.e. as a result of adhering to testing indicated by evidence-informed guidelines associated with PIN indicators)?

### **Cost effectiveness**

- Is evidence-informed cancer screening in Primary Care cost-effective?
- Is increased “disease management control” for individuals living with diabetes cost-effective relative to individuals whose disease is not “controlled”?
- What additional data and evidence are required to assess the cost-effectiveness implications of PIN site diabetes management in relation to the control of diabetes modeled in the cost-effectiveness analysis study?

## METHODS

This report summarizes findings from the following PIN-related evaluation activities:

- PIN evaluation of demonstration phases
- Estimating the Cost-Effectiveness of Evidence-informed Primary Care: A Microsimulation Analysis of Cancer Screening & Diabetes Management
- Analysis of laboratory test utilization by 2 of the Phase 1 PIN groups
- Review of program documents to identify themes re: changes in family practice provider access to and use of information and lessons learned re: EMR use and functionality

**Table 1.** Summary of PIN Evaluation Activities 2008-2011

PIN Evaluation Activity / Report	Study Design	Sample	Measures / Instruments	Year completed and report source
PIN evaluation of demonstration Phase 1	Summative evaluation	4 Phase 1 demonstration sites  Qualitative interviews (N=14)  Quantitative patient surveys (n=1,213), provider surveys (n=38), indicator data analysis		2009  <a href="http://www.gov.mb.ca/health/phc/pin/docs/phase1evaluationreport.pdf">http://www.gov.mb.ca/health/phc/pin/docs/phase1evaluationreport.pdf</a>
Estimating the Cost-Effectiveness of Evidence-informed Primary Care: A Microsimulation Analysis of Cancer Screening & Diabetes Management	Cost-Effectiveness Analysis	Costing model cohorts based on varying levels of testing/screening	Markov modeling exercise	2011  <a href="http://www.gov.mb.ca/health/phc/pin/docs/cea.pdf">http://www.gov.mb.ca/health/phc/pin/docs/cea.pdf</a>
Analysis of laboratory test utilization by 2 of the Phase 1 PIN groups	Quantitative data analysis	2 PIN sites	Private lab billings data	2011 – ad hoc analysis for this report
Review of program documents to identify themes re: changes in family practice provider access to and use of information and lessons learned re: EMR use and functionality	Document analysis	Review of minutes and change request briefs from PIN physician committee, notes from site visits, EMR vendor discussions, e-mail correspondence		2011 – ad hoc analysis for this report

## FINDINGS

### PIN Evaluation Findings

The PIN initiative has been evaluated throughout the demonstration period. The evaluation plan was developed in collaboration with the PIN team at Manitoba Health and Dr. Alan Katz of the Section of Family Medicine, University of Manitoba. The plan was designed to measure the impact of PIN on patient care and provider/patient satisfaction, in relation to the PIN objectives. Study methods include patient surveys, provider surveys, EMR data analysis, and interviews with key stakeholders in the clinic and associated Regional Health Authorities. Each phase of PIN has been evaluated in this manner, using a *pre-post* design.

As of the writing of this report, the *post* study of Phase 2 of PIN is underway and is expected to be finalized during the Spring 2012. The findings of Phase 1 of PIN will be presented here, based on evaluation of the original four PIN Phase 1 sites. The following section is taken from the Phase 1 Evaluation Report<sup>2</sup>, authored in July, 2011 by Prairie Research Associates (PRA); the research and evaluation firm that undertook the evaluation.

#### Phase 1 Evaluation Findings – Excerpt from Phase 1 Report

Three group practice sites participated as demonstration sites in Phase I of PIN: Agassiz Medical Centre in Morden, Dr. C. W. Wiebe Medical Centre in Winkler, and Assiniboine Clinic in Winnipeg. Steinbach Family Medical Center participated as the control site. Each clinic, with the exception of Steinbach, chose an area of concentration as part of the demonstration. The Winkler clinic focused its efforts on preventative practices and coronary artery disease. Assiniboine Clinic and the Morden clinic targeted hypertension and diabetes. As the Steinbach clinic was the control site, its main involvement in Phase I included implementing information management changes and using its EMR system to begin collecting information on clinical process indicators.

#### *Challenges to Implementation*

All sites faced a number of challenges during PIN implementation, stemming from both project related and external factors. For example, PIN indicators were being continuously modified throughout Phase I as sites were in the process of implementing changes. Challenges in retrieving data from external sources were also found throughout implementation (e.g., immunization data from Manitoba Information Management System). Clinics were also initially hesitant, given the uncertainty surrounding the sustainability of the demonstration project, to hire additional staff or make substantial PIN-related investments; this may have complicated practice change in the areas of data quality, space provision, and equipment needs.

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<sup>2</sup> Evaluation of the Physician Integrated Network (PIN): Phase 1 Summary Report, available at <http://www.gov.mb.ca/health/phc/pin/docs/phase1evaluationreport.pdf>

In addition to the above challenges faced by PIN clinics generally, demonstration sites noted some clinic-specific challenges, though these issues may also apply more broadly. In particular, Dr. C.W. Wiebe Medical Centre in Winkler noted that change management was a significant challenge when communicating and following up on changes with a large staff including 23 physicians. Agassiz Medical Centre noted that during the initial stages of Phase I, the centre dealt with the release of management staff and a lengthy vacancy of the position. The clinic also struggled with challenges utilizing the EMR in the manner required for PIN. Assiniboine Medical Clinic also experienced these EMR-related challenges, particularly in regards to data quality.

Steinbach Family Medical Center experienced physician attrition during Phase I, resulting in approximately a third of the clinic's patients having a change or loss of physician. This may have affected indicator data directly, as well as indirectly through reduced achievement by remaining physicians who, as a result of the attrition, carried greater workloads. Also, because of its designation as a control group, Steinbach FMC did not conduct any specific staff training on PIN during Phase I. The clinic did educate physicians about the nature of the data being collected but generally did not provide individualized data reports to physicians on their indicator achievement.

#### *Findings – Access*

Stakeholders generally believed that access to physicians remained relatively unchanged by PIN. However, they reported that access to allied health care providers (AHCPs) had been enhanced by PIN; since on-site AHCPs worked collaboratively with physicians to meet the primary health care needs of patients; these findings indicated that the PIN objective to improve access to primary care was partially met.

Patient survey results also offered some indication of progress towards this objective. Patients at the Winkler clinic reported increases in access to services over time, in contrast to decreases in access reported at the control site, while results for Assiniboine clinic were mixed. Similarly, patients from the Winkler clinic reported an increase in the use and coordination of specialists and special services over time, while control site patients reported a decrease. Patients reported no change in the services available at their clinics.

#### *Findings – Access to and use of information*

Stakeholders reported that clinics' use of EMR to track and report on indicators had improved physician awareness of and adherence to standards and guidelines for patient care, and enabled clinics to monitor physicians' PIN compliance. These data and information enhancements indicated movement on the second PIN objective, to improve primary care providers' access to and use of information. Increased tracking and reporting capabilities through the addition of more indicators offered further potential for improvement in access to and use of information.

#### *Findings – High quality care and chronic disease management*

Clinic stakeholders believed PIN processes had improved the consistency and comprehensiveness of patient care, particularly for patients with chronic disease, through EMR testing reminders and the integration of AHCPs. These findings appeared to indicate progress on the PIN objective to demonstrate high quality primary care with a specific focus on chronic disease management. Improvements were expected to continue in this area as clinics integrated more indicators and as PIN processes became embedded in practice.

Interview findings were confirmed by EMR data. In general, there were increases in nearly all indicator clusters, with the exception of the asthma indicator cluster. The prevention and congestive health failure clusters, in particular, trended upwards over time across most of the individual indicators. Increases in the diabetes clusters were more modest, as many of the individual indicators began at relatively high levels. The hypertension cluster showed increases at the three demonstration sites, while there was negligible change at the control site. The data showed no consistent trends for the coronary artery disease indicator cluster, though there was some indication of improvement over time in individual indicators.

Patient survey data also offered some insight into progress towards this objective. According to patients, ongoing care increased over time at Assiniboine clinic and decreased over time at the Steinbach clinic. Patients at the Morden clinic mentioned an increase in the services received at the clinic. Patients at all clinics reported increases in family-centeredness since the onset of PIN, particularly at the Winkler clinic.

#### *Initial findings from Phase 1 of PIN on select Chronic Disease Management and Prevention Indicators*

Although the evaluation of Phase 2 of PIN is ongoing, analysis of EMR data extracts from participating Phase 1 sites has been updated to track progress on select PIN indicators over time for the Phase 1 PIN sites. Tables 2 and 3 below display the percentage of eligible patients that received the specified test or screening in 2008, 2010 and 2011. Eligible patients are those for whom the test is recommended, according to clinical practice guidelines.

For 2008, indicator data were available for the 3 PIN sites that were, at the time, tracking chronic disease indicators; 2 of these sites were also tracking prevention indicators. 2011 data for respective indicators were available from all 4 PIN sites from Phase 1. Tables are based on EMR data extracts from participating clinics which were reported in quarterly PIN reports by Manitoba Health to participating PIN sites. These reports calculate achievement across PIN indicators according to standardized indicator definitions as articulated in the PIN Information Management Guide<sup>3</sup>. PIN indicators with known data artefacts (e.g. EMR documenting challenges, reliance on problematic system data) were not included in this analysis.

It should be noted that it is not possible to attribute cause to indicator achievement. Some of the achievement is likely due to improved data quality, where some may represent the benefits of an optimized EMR system and increased attention paid to a service by providers. For these reasons, indicator achievement should be interpreted along with other qualitative evaluation findings, such as stakeholder interviews, surveys, etc.

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<sup>3</sup> available at <http://www.gov.mb.ca/health/phc/pin/docs/infomanageguide.pdf>

Table 2. Select PIN Indicator Results

		Spring 2008	Fall 2010	Fall 2011
Prevention	Colon Cancer screening	25.5%	66.5%	64.2%
	Dyslipidemia screening	53.8%	87.3%	89.2%
	Cervical cancer screening	62.0%	64.0%	73.1%
	Breast cancer screening	56.5%	64.0%	68.8%
Diabetes	Nephropathy screening	49.0%	68.1%	78.6%
	Full Fasting Lipid profile screening	60.7%	79.2%	82.7%
	Obesity/Overweight screening	66.7%	79.6%	81.5%
	HGB A1C	78.3%	84.1%	90.8%
	Blood Pressure testing	87.0%	88.6%	92.0%
Hypertension	Full fasting lipid profile screening	50.7%	73.1%	78.6%
	Obesity/Overweight screening	53.0%	77.5%	77.7%
	Blood Pressure measurement	86.7%	87.6%	90.2%
	Renal dysfunction test	74.3%	80.3%	85.8%
CAD	Fasting blood sugar	69.0%	76.4%	84.9%
	Blood Pressure measurement	89.0%	89.0%	92.2%
	Lipid reduction counselling	69.5%	67.5%	77.6%
	Full fasting lipid profile screening	57.0%	80.9%	83.2%
	Obesity/Overweight screening	54.0%	78.4%	76.6%

Source: EMR extract data from Phase 1 sites; 2008 = 3 sites tracking CDM, 2 sites tracking prevention, 2011 = 4 sites. Please note that since proportions for each evaluation period are based on different numbers of clinics, they may not be directly comparable.

### Improving access to and use of information

Of primary concern to this report is the PIN objective of improving provider access to and use of information. PIN sites are supported by a number of information supports that assist in tracking performance on PIN indicators, facilitating peer comparisons, and identifying patients overdue for a particular service. The following supports have been identified following a document review of the PIN initiative, including meeting notes from regular site visits, and standing committees:

#### *PIN program supports*

- Regular achievement reports – reports provide clinics with a quarterly snapshot of indicator achievement at the group practice level. For each indicator, the previous quarter result is also displayed, as is the average achievement of all PIN clinics.
- PIN staff have occasionally provided sites with a comparison of the patients the clinic considers ‘core’ (i.e. patients with a regular provider at the clinic) against administrative billings data. This comparison allows for identification of patients that no longer receive the majority of care from

the clinic. This has implications for strengthened continuity of care, and a more formalized enrollment process, which will be built into EMR functionality in Manitoba (see discussion section for further detail). Analysis was also undertaken to compare indicator achievement between cohorts of patients: those identified as 'core' but not verified by billings data received lower volumes of testing, supporting the benefits of continuity of care.

#### *Clinic and EMR software driven supports*

- Automatic prompting – e.g. flagging that the patient being seen is overdue for a colon cancer screening or a regular blood pressure check, according to intervals supported by clinical guidelines and the PIN set of indicators.
- Provider-level reports for within clinic peer-to-peer comparison.
- List generation of patients that are overdue to a specific service, allowing the clinic to proactively arrange visits
- Tailored searches – similar to list generation of non-compliant patients, however more specificity can be added to identify those with multiple items not in compliance. Some sites have done this in a phased manner beginning with 3+ items overdue, then later 2+, then 1+.
- List generation of patients to determine which are truly active. Some sites have used these lists to contact patients to determine whether the patient is still an active patient of the clinic, and to encourage an appointment booking if needed.
- Virtual shared drive containing material relevant to PIN indicators – e.g. recent journal articles, best practice guidelines, EMR workflow guidance

As reported above, 2010 National Physician Survey results found that 34.6% of Manitoba family physicians reported using electronic records to enter and retrieve clinical patient notes and 28.5% reported using electronic reminders for recommended patient care. This compares to the national figures of 41.3% and 27.9%, respectively. A 2009 survey of Phase 1 PIN physicians found that 88% reported using electronic records to enter and retrieve clinical patient notes, and 64% reported using electronic reminders for recommended patient care<sup>4</sup>. Monitoring of self-reported use of technology will be a part of ongoing PIN evaluation.

#### **System Impact**

Of interest to PIN is the impact any expanded testing has on the diagnostic services, and whether there are capacity implications. Although it is difficult to isolate a "PIN effect", some preliminary analysis has been undertaken as another potential line of evidence supporting increased ordering due to PIN, even if it is still too early to point to any clear efficiency implications.

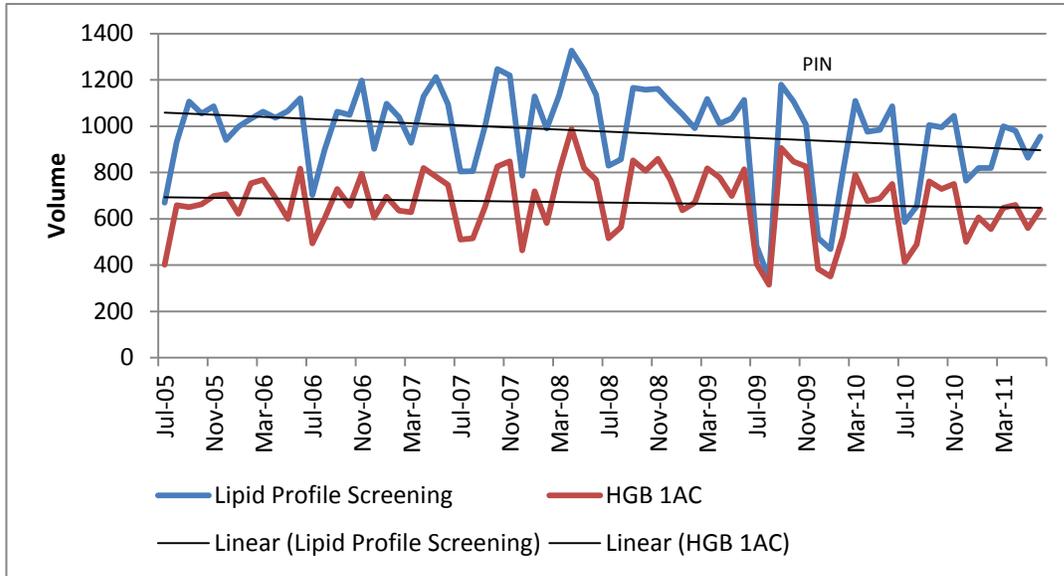
The preliminary analysis of system impact of PIN was possible through private lab data, based on billings. Public lab volumes, however, are not currently available from information systems, limiting this analysis to only two of four Phase 1 sites. Laboratory claims for glycated hemoglobin testing (HGB A1C) and lipid profile testing where the referring physician was a physician at Clinic A or Clinic B were selected for inclusion, regardless of which lab performed the analysis. An approximately three year pre-PIN period and a three year post-PIN period was used.

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<sup>4</sup> <http://www.gov.mb.ca/health/phc/pin/docs/phase1evaluationreport.pdf>

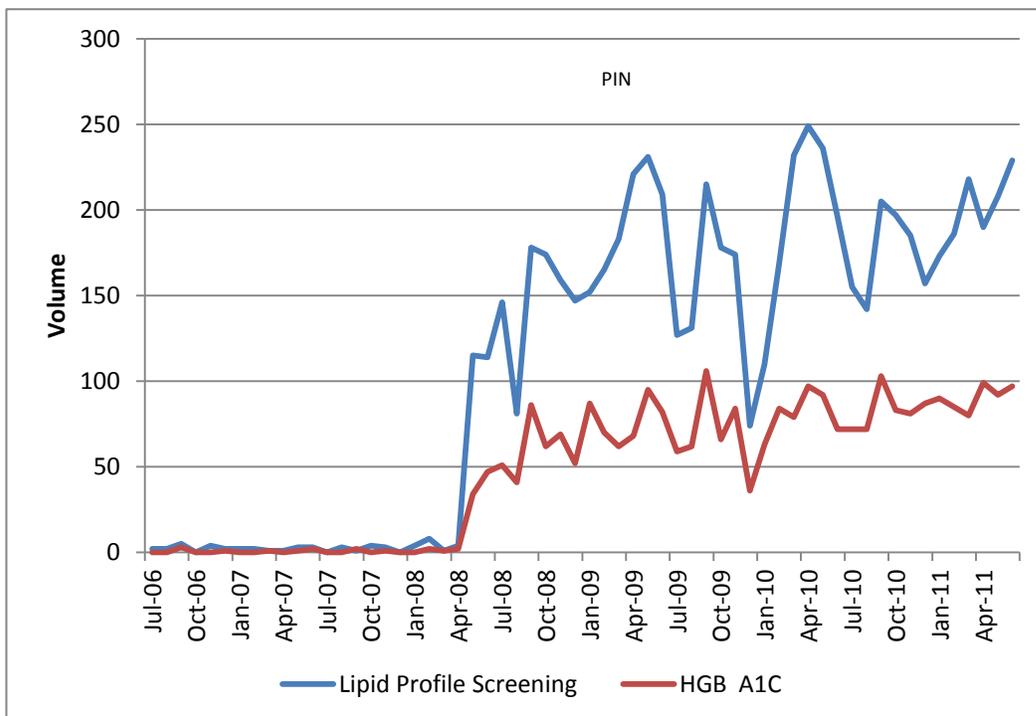
Clinic A

No discernible trend was found for Clinic A in either test.



Clinic B

Completed lab orders for both lipid profile testing and HGB A1C increased as of April 2008 and continued to trend upward throughout Phase 2 of PIN. However, the pre-2008 figures reflect an absence of data, not lack of testing. Clinic B switched to a private lab in early 2008; which resulted in lab data becoming available.



At this time, it is problematic to attribute increased ordering to PIN activities, as there may be other causes, such as more responsive testing from the new lab, increased capacity, etc.

Although this preliminary analysis is not able to provide conclusive data on the ordering impact of PIN, a more fulsome analysis should be possible in future. Many of the newer sites that joined PIN in Phase 2 use private labs, providing for a future set of data that may allow for more pre/post comparisons. Moreover, it may be possible to correlate lab ordering against indicator achievement to provide further insight into whether increasing indicator achievement results in increased ordering, and what supports (e.g. EMR prompting) facilitate that increase.

### **Cost effectiveness**

In July 2011, a report was produced that analyzed the cost effectiveness of select primary care services that aligned with the PIN cancer screening and diabetes management indicators. The intent of this analysis was to explore whether the benefits of increased screening and diabetes control might reach beyond individual patient benefit and result in health system savings.

The following boxed sections are taken from the “Estimating the Cost-Effectiveness of Evidence-Informed Primary Care”, authored in July, 2011 by Prairie Research Associates (PRA)<sup>5</sup>.

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<sup>5</sup> Available at <http://www.gov.mb.ca/health/phc/pin/docs/cea.pdf>

### *Cancer screening findings*

In terms of the three cancers examined in the CEA, breast and colorectal cancer readily show the potential for cost avoidance through the alignment of primary care screening practice to PIN screening guidelines for breast and colorectal cancers. Under the high cost scenario described above, the breast cancer CEA model suggests a potential avoided cost of \$2,581,200 over no screening, and a potential avoided cost of \$717,000 over current screening practice over a 25-year period. The colorectal cancer CEA model shows even greater avoided costs, with corresponding results for \$57,511,800 and \$10,662,300 over the same number of years. By contrast, the cervical cancer CEA model shows increased health system costs through the alignment of primary care screening practice to PIN screening cervical cancer guidelines under all scenarios and assumptions. The low incidence of this condition means that the costs of delivering a program of cervical cancer screening in Manitoba are not recovered by the reduced costs associated with earlier cancer detection.

### *Diabetes findings*

In reference to diabetes, the research shows that increasing an individual's likelihood of diabetic control from 70% to 100% generates a total avoided cost of \$1.1 million over a 40-year period. However, it is critical to recognize that these results include only the financial costs involved in managing the consequences of diabetes-related health complications. They do *not* include the financial costs involved in implementing interventions aimed at managing diabetic control. Much of the control involves patients being able to alter diet and exercise and follow medication protocols. For many, powerful social and economic factors preclude their participation in the treatment protocols and many lack the resources required to maintain critical levels of health determinants. Only if the avoided costs resulting from a given increase in diabetic control exceed the value of increased expenditures required to carry out these interventions can it be argued that these interventions avoid costs. The inclusion of potential intervention costs in the CEA for diabetes was beyond the scope of this study.

## **DISCUSSION AND CONSIDERATIONS FOR SUPPORTING AND MEASURING EVIDENCE-INFORMED PRIMARY CARE**

PIN has provided a unique opportunity to explore the benefits of an optimized EMR system on patient care. The initiative has encouraged appropriate use and supported provider change to workflow and primary care practice. Financial incentives have not been the primary driver of provider behaviour, but QBIF has been a lever which has ensured that additional attention required for delivering service and documenting are compensated for. The following discussion centres on the evaluation questions raised in the Scope and Purpose section of this report.

## *Patient Access*

PIN has partially met the objective of improving patient access to care, as reported in the Phase 1 evaluation document. Access to non-physician providers has improved, although access to physicians has remained unchanged. Longer term evaluation involving a greater number of sites will be useful in exploring access further, particularly following the upcoming implementation of a patient access indicator measured through a patient survey. This is intended to measure access that is based on patient expectations, while providing clinics with more information on patient preferences and challenges to access. Further exploration of the difference between greater ability to access (i.e. get a convenient appointment) versus access to appropriate services (i.e. quality of access) will also be worthwhile for routine and urgent visits.

## *Access to and use of information*

Improving access to and use of information has been a strength of the PIN initiative. Throughout Phase 1 of PIN, a great deal of effort was required to support the standardized collection of data through EMRs, while ensuring support of the provider/patient encounter. This ultimately allowed for accurate reporting on indicator achievement and supports meaningful clinical decision support mechanisms. There were, however, challenges, particularly in EMR solutions that were overly reliant on text-based data entry, making standardization and data extraction very challenging and administratively burdensome. These problems have by and large been resolved and clinics are using much more standardized data entry processes. Much work remains however in better aligning data entry with the flow of the patient/provider visit.

A key learning for those involved in the PIN initiative has been to engage clinicians in a meaningful way; the process for indicator refinement has been driven by site representatives that not only have the most up-to-date knowledge on clinical guidelines, but also best understand patient treatment workflows, and EMR optimization. Other key learnings and guiding principles of PIN implementation have been:

- that data cannot be collected for its own sake;
- an extra step to collect data not meaningfully integrated with the patient encounter is a burden to patient care;
- that duplicate entry of information is unacceptable to providers, hence reducing data quality, and jeopardizing quality care;
- that EMR prompts best function when aligned with normal workspace in the EMR solution, not located in a separate 'PIN module';
- that prompts are useful, but can also be distracting – one physician related an anecdote of a patient feeling ignored and not listened to while the physician was distracted by multiple prompts. A balance must be struck between prompting for recommended testing, and a focus on patient centred care;
- that prompts can introduce a competitive aspect to eliminating overdue flags. One physician remarked that this worked for him as he is “type A” and the presence of red highlights is motivation enough. He also remarked that this may be effective in motivating some providers, but won't be for all.

PIN staff at Manitoba Health and Manitoba eHealth have also tried to find a balance between translating the process preferences expressed by clinicians to change requests to the EMR vendors, and respecting the vendors' need for customization and tailoring to a wider base of customers.

Finally, the importance of information that reflects the importance of the patient-provider relationship and thus, continuous and comprehensive primary care, has become apparent through PIN implementation. Relying on clinics to identify who their patients are is largely accurate, although imperfect. Clinics do not have access to provincial system information showing the extent to which patients rely on other sites for chronic disease management, after hours visits, etc. PIN clinics have now agreed to a more active patient enrollment process which will encourage a conversation with the patient on whether or not the site is indeed their "primary care home"; clinics will document this enrollment in their EMR. Centralized collection of these data will allow for a more accurate picture of where patients are accessing ongoing comprehensive care. Although these learnings were primarily gleaned from refining the inclusion/exclusion rules for indicator calculation, much broader benefits of identifying a patient's true primary care home have been realized; particularly with respect to improved continuity and subsequently enhanced quality care, the potential for improved information flow between acute and primary care settings, and reduced duplication in patient care, testing, etc. These learnings are very much aligned with the concept of a patient-centred medical home, now supported by a number of groups including the College of Family Physicians of Canada<sup>6</sup>.

### *Quality of Care*

Evaluation findings suggest PIN processes have improved the consistency and comprehensiveness of patient care; as supported by qualitative and quantitative evaluation findings. Patients have also reported an increase in services and family-centredness. As indicated by PIN participants, different practices are motivated by different combinations of factors, including improved EMR prompting, the integration of additional care providers, and financial incentives. Peer competition and motivation has also been cited as a key component of PIN success, both from within a practice and across group practices. Regardless of the motivation, enabling supports are clearly a necessary contributor to quality care under the PIN approach. These have allowed for more pro-active delivery of care, where providers have greater support for decision making and outreach to patients overdue for services. Future evaluation of the PIN initiative through the Manitoba Centre for Health Policy will explore what, if any, impact that improved quality primary care processes translate to improved patient outcomes.

### *Cost Effectiveness*

There is preliminary evidence that higher rates of breast cancer and colon cancer screening in primary care can be cost effective. Cervical cancer screening may not be cost effective, primarily due to the need for wide screening to identify a relatively low incidence cancer. Of course, this does not discount the value of screening to the patient; just that earlier screening does not result in system savings. Improved diabetes management through primary care appears to be cost effective, although it is difficult to link specific primary care testing (e.g. haemoglobin A1C testing) to the notion of 'control'. Diabetes 'control' is highly dependent on determinants of health (such as diet and lifestyle) other than primary care services, so further work must be done to correlate care with outcomes before clearer

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<sup>6</sup> [http://www.cfpc.ca/A\\_Vision\\_for\\_Canada/](http://www.cfpc.ca/A_Vision_for_Canada/)

statements on the cost effectiveness of diabetes care and the potential for true cost avoidance can be made.

A number of future steps were identified in the cost-effectiveness analysis that would result in a more comprehensive investigation<sup>7</sup>. Briefly, improved costing data for the potential future treatments would allow for a more precise analysis. Additional modelling work would be required to layer in costs unique to initiatives like PIN (e.g. provider incentive funding) or screening campaigns, allowing for an even more refined analysis of system cost effectiveness. A better comparison source of data between PIN and non-PIN sites would also allow for more accurate comparative analysis of screening/testing practices. This may be possible as more clinics submit EMR data in Manitoba. Finally, including data on the determinants of health and the social and broader economic costs of increasingly severe disease would capture more personal and societal causes and costs in the analysis.

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<sup>7</sup> <http://www.gov.mb.ca/health/phc/pin/docs/cea.pdf>