Executive Summary

In recent years, governments across Canada, and internationally, have passed legislation and regulations to enable an expanded scope of pharmacy service. This October, Ontario followed suit and the scope of services that pharmacists in the province can now offer has been broadened. Enabling pharmacists to take on a greater role in primary care is widely regarded as an opportunity to improve patient experience, save healthcare costs and relieve stress on the system. Nevertheless, no province has yet undertaken an economic analysis to demonstrate the value that pharmacists’ expanded services can deliver both to government and to the healthcare system as a whole.

Objective:

The Ontario Pharmacists’ Association (OPA) engaged Accenture to conduct an economic analysis to measure the costs and benefits of pharmacist authorities in five key areas. These authorities represent both services that have recently been granted (counseling and prescribing for smoking cessation, administering flu vaccinations, drug therapy modification (including adaptations) and renewing prescriptions) and other services that have not yet been approved (prescribing for minor ailments). The purpose of the engagement is to:

- Demonstrate the economic impact of pharmacist expanded authorities on the healthcare system, specifically as they pertain to health services utilization (inpatient, ED and family physician visits avoided), utilization of the Ontario Drug Benefit (ODB) plan and improvements in health system efficiencies (e.g. shifts to lower-cost providers).
- Illustrate the qualitative impact on patient health outcomes and health system capacity.
- Design a sensitivity analysis in order to illustrate alternate outcomes for inputs identified as potentially variable.

Methods:

The approach to undertaking this economic value analysis began with an in-depth review of the academic literature that was supported by the OPA and subject matter experts. Online databases, such as MEDLINE, PubMed, EMBASE, and IPA were searched in addition to reports and datasets from leading healthcare organizations and provincial healthcare Ministries. Online searches were also undertaken to include gray literature, such as news articles from regional and national news sources. Accordingly, the findings are based on 150 peer-reviewed papers, articles and datasets from 1990-2012.

To complement the literature findings, ten interviews were conducted with employees from Alberta Health Services, The Ontario Ministry of Health and Long-Term Care, University of Toronto, the Institute for Clinical and Evaluative Sciences (ICES), and finally provincial pharmacy associations in British Columbia, Alberta and Saskatchewan.

Following the data collection phase, an adaptable five-year predictive model was created using an incremental cost-benefit analysis to identify the marginal value of pharmacists offering the five expanded scope services. In order to determine economic value, a financial method of evaluating investments known as Net Present Value (NPV), was used. This method involves assessing cash inflows (referred to as benefits) and cash outflows (referred to as costs) in order to calculate overall savings to the provincial government. Once these benefits and costs are calculated over a five-year time horizon, a discount rate is applied to convert benefit and cost figures into present value figures. The discount rate
takes into account the time value of money (the idea that money available now is worth more than the same amount of money available in the future because it could be earning interest) and the opportunity cost of capital (the possibility that government funds could be spent on an alternate project or program). All NPV values are reported in 2012 terms. All inputs and outputs were considered from the government’s perspective. The study’s outcomes reflect anticipated government savings and costs as opposed to savings and costs that may be realized by a more broadly defined system that would include the private sector. Accordingly, savings from factors such as increased productivity and decreased employee absenteeism are not included in this analysis. Had such inputs been incorporated, the total NPV and program benefits would have reflected significantly higher values. Once base cases were determined, a sensitivity analysis was built for variables that were determined to have high variability. This feature of the model provides insight into the ranges that may be considered for program costs and savings. All NPV values referenced in this report reflect the base-case NPV. Minimum and maximum values are reported in brackets to reflect the potential ranges that one could expect. These ranges are based on the sensitivity analyses conducted.

**Results**

The findings show that a net present value of $143.14M ($20.43M-$536.46M) can be realized by the province within a five-year time period from 2013-2017 if the government were to fully implement and reimburse pharmacists in all five authority areas. In addition, trending data suggests that economic benefits will continue to grow in the future beyond 2017 for the majority of expanded scope areas. The range for the net present value may be seen in parentheses above. The high maximum value in the range reflects the fact that conservative estimates were used throughout the economic model and that the potential for higher financial benefits than those illustrated in the base cases could be achieved. Indeed, the Ontario government could conceivably save half a billion dollars over a five year period by expanding pharmacists’ services in the five authority areas discussed in this paper. A summary of the findings are shown in the following graph and table below:
Figure 1: Maximum, Base Case and Minimum Net Present Values for Five Authority Areas from 2013-2017

Table 1: Net Present Value (NPV) for Five Authority Areas from 2013-2017 (in $millions)

<table>
<thead>
<tr>
<th>Authority</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>NPV 5-yr total (min – max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking Cessation (Drugs and Counseling)</td>
<td>$2.51</td>
<td>$5.05</td>
<td>$8.81</td>
<td>$13.52</td>
<td>$19.28</td>
<td>$49.17 ($12.03 - $62.48)</td>
</tr>
<tr>
<td>Influenza Immunization</td>
<td>$0.18</td>
<td>$0.37</td>
<td>$0.22</td>
<td>-$0.02</td>
<td>-$0.26</td>
<td>$0.48 (-$7.12 - $0.5)</td>
</tr>
<tr>
<td>Minor Ailments</td>
<td>$0.53</td>
<td>$1.09</td>
<td>$2.05</td>
<td>$3.86</td>
<td>$4.80</td>
<td>$12.33 ($7.51 - $116.55)</td>
</tr>
<tr>
<td>Renewing Prescriptions for Stable Chronic Disease Medications</td>
<td>$0.24</td>
<td>$0.39</td>
<td>$0.85</td>
<td>$1.74</td>
<td>$2.47</td>
<td>$5.69 (-$12.89 - $24.27)</td>
</tr>
<tr>
<td>Total</td>
<td>$14.01</td>
<td>$20.50</td>
<td>$29.19</td>
<td>$41.32</td>
<td>$53.24</td>
<td>$143.14 ($20.43 - $536.46)</td>
</tr>
</tbody>
</table>

*Note that totals are based on full calculations from the economic value model and discrepancies in the above table are due to rounding.
1. Smoking Cessation Counseling & Drug Therapy:

As presented above, a net present value of $49.17M ($12.03M-$62.48M) is expected over a five year period from 2013 to 2017 from pharmacists providing both prescription drug therapy (Zyban and Champix) and smoking cessation counseling. In total, benefits for the base case were shown to yield a total of $58.3 million over five years, driven predominantly by avoided healthcare costs. These avoided healthcare costs were limited to the 5-year model period and are not reflective of lifetime healthcare costs saved. Additionally, a shift in health human resource costs from physicians to pharmacists accounted for a small proportion of cost savings. Benefits are offset by costs which stem from payments to pharmacists and smoking cessation drug costs for Ontario Drug Benefit (ODB) recipients. The range for the NPV is largely attributable to the decreased tax revenues that would result from successful quitters avoiding purchase of cigarettes.

The qualitative benefits from pharmacists offering this program are wide ranging. Improved smoking cessation among the Ontario public can help to reduce tobacco-related mortality rates (currently at 15,933/year), second-hand smoke related mortality (315/year) and tobacco-related morbidity. Additionally, as more people turn to pharmacists for smoking cessation therapy, this would free up healthcare resources in terms of availability of hospital beds and family physician appointments. Easier access to care, convenience, and shorter wait times are also direct benefits impacting healthcare consumers. Lastly, all of the above may positively impact workplace productivity (not quantified in current report).

Key Takeaways:

- Benefits for this program exceed costs beginning in 2013.
- Smoking cessation interventions are effective in improving smoking cessation success rates;\(^1\) they represent an extremely cost effective way of reducing morbidity, prolonging life, and easing the burden on the healthcare system.\(^2\)
- Pharmacist-rendered counseling results in an average cessation rate that is approximately the same as counseling rendered by physicians.\(^3\) Because a pharmacist on average has more touch points with consumers than a physician, allowing for pharmacists to initiate prescription drug therapy for smoking cessation may help to increase uptake.
- A combined intervention of prescription drug therapy and counseling has demonstrated a success rate that is between 2% -5%\(^4\) higher than a combination of nicotine replacement therapy (NRT) and counseling. Therefore enabling pharmacists to prescribe Champix\(^\text{®}\) and Zyban\(^\text{®}\) can lead to more successful outcomes.

2. Administering Influenza Vaccinations

The net present value for pharmacists administering flu vaccinations over a five year period from 2013 to 2017 is anticipated to be minimal at $0.48M (-$7.12M-$0.5M). The anticipated economic benefit for the base case resulting from avoided healthcare utilization equaled $22.67 million. These benefits were driven largely by avoidance of flu-related hospitalizations. Costs surprisingly exceeded benefits due in large part to pharmacists not serving as the lowest-cost provider as in other authority areas. In total, payment to pharmacists equaled $22.19 million, which was partially offset by avoided payments to
other health care professionals of $5.34 million. Vaccine costs were estimated at $7.60 million and were accounted for within the sensitivity analysis.

The qualitative benefits of pharmacists providing influenza vaccinations are highly compelling. Evaluations of pharmacist-led flu vaccinations in other jurisdictions have demonstrated that flu vaccination rates increase when pharmacists are also allowed to administer the vaccines. This is likely due in part to increased patient convenience and access (reduced time commitment, increased number of locations and longer operating hours). As immunization rates increase from the current 30% rate in Ontario, it is expected that some benefit from herd immunity may also ensue. Lastly, similar to the smoking cessation program, workplace productivity and a slight increase in healthcare capacity may also be anticipated due to lower rates of flu infection in the province.

**Key Takeaways:**

- Pharmacists’ authority to administer flu vaccines leads to increased immunization rates; from 2013 to 2017, pharmacists can be expected to administer 3.43 million net new flu shots to Ontarians.
- The increase in influenza immunization rates due to expanded pharmacist authority can avert 241 flu-related deaths over a five-year time period.
- Pharmacists have been shown to administer vaccinations both safely and effectively.

### 3. Prescribing for Minor Ailments

The net present value of pharmacists prescribing for nine specific minor ailments from 2013 to 2017 is estimated at $12.33M ($7.51M-$116.55M). Economic benefits due to avoided ED and family physician visits were anticipated to total $31.58 million in the base case, driven largely by avoided visits to primary care physicians. These were offset by payments to pharmacists for their services which were calculated at $19.27 million. The large positive variance was due mostly to the potential for more patients to shift from physicians to pharmacists to seek minor ailment services than the rate presented in the base case. This consideration was based on discrepancies in shift trends between jurisdictions such as Saskatchewan and the United Kingdom.

The most significant qualitative benefit anticipated from granting prescribing authority for minor ailments is the increased capacity that it may create in the healthcare system. Evaluation of minor ailment schemes in England has demonstrated that a significant proportion of patients (up to 40%) with minor ailments shift from family physicians to pharmacists, thus reducing family physician workload and allowing capacity for patients with more acute conditions.

The nine minor ailments at family physician offices represent an estimated 945,165 hours’ worth of time in 2013 and that if a percentage of these patients could be shifted to pharmacists, it would allow for an increased number of available family physician appointments. In addition, implementing a pharmacist-led minor ailments program in Ontario stands to offer patients greater choice, increased convenience, and effective care, as has been demonstrated in other jurisdictions throughout England. Furthermore, it helps achieve the Ministry of Health’s recent action plan, particularly with respect to issues of faster access to care and providing the right care at the right place and right time.
4. Prescribing for Renewals

The net present value for pharmacists renewing prescriptions for stable chronic disease patients from 2013 to 2017 is estimated at $5.69M (-$12.89M-$24.27M). Unlike other authority areas, this authority solely examined the shift in labour from family physician to pharmacists. The NPV range which is provided reflects various compensation rates to pharmacists as well as the variability in the number of physician visits which could potentially be avoided.

In terms of qualitative benefits, independent renewals can potentially improve patient adherence to medication therapy, thus improving health outcomes. Improved patient convenience, choice, and productivity are also anticipated as outcomes.

Key Takeaways:

- In the base case, benefits are realized immediately.
- Improved patient convenience, choice, and productivity can be expected.
- The largest potential qualitative benefit is the possibility that stable chronic disease patients may be more adherent to their medications.

5. Pharmaceutical Opinion Program (POP) and Independent Adaptations

The net present value for pharmacists adapting prescriptions either independently or through consultation with the original prescriber is estimated at $75.47M ($20.90M-$332.66M). Economic benefits for the base case are high at $109.13 million, and are predominantly driven by the avoided costs of hospitalization due to adverse drug events (ADEs). Economic costs for the base case consist of $33.66 million, attributed solely to payments to pharmacists for their services. Savings are significant in this authority area since it accounts for hospitalization, ED and family physician-related costs as compared to some other authority areas which do not account for savings from all three health provider channels. Additionally, due to the nature of the pharmacist adaptation program, savings are not due to patient behavior or a shift from physicians to pharmacists, but rather are the result of the number of adaptations a pharmacist initiates on his or her own. Consequently, the impact of the program is constrained only by the amount of ADEs that are reasonably preventable and the skill of the pharmacists in detecting potential ADEs in patient drug prescriptions. The NPV variance in this model is based on a high degree of variability in current published literature. Specifically, the proportion of ADEs preventable by pharmacists and the prevalence of ADEs across the health system were taken into consideration in the sensitivity analysis.
The qualitative benefits of an expanded pharmaceutical opinion program (POP) are significant. Pharmacists’ adaptations have been shown to improve efficiency of care and prevent or resolve ADEs. Through the prevention and resolution of adverse drug events, pharmacists may positively impact rates of morbidity and mortality that typically result from these ADEs.

**Key Takeaways:**

- Benefits exceed costs immediately.
- Large healthcare costs (particularly hospitalizations and ED and family physician visits) can be avoided due to prevention or resolution of ADEs by pharmacists.

Studying the outcomes of expanded pharmacist services demonstrates the increasingly important role that pharmacists can play in providing healthcare for Ontarians. First, the accessibility of this provider channel stands to improve the patient experience and the ease with which patients may secure appropriate treatment options. This can help to support the government’s current activities in developing more patient-centered care. Second, establishing a wider base of healthcare providers for select services could create increased system capacity which in turn, can reduce wait times for patients with more complex disease states. This again aligns with both government and patient interests. Third, four out of the five programs assessed in the model are anticipated to be cost-saving for the Ministry of Health and thus would help the government to reduce overall healthcare spending. Lastly, obtaining the right care at the right time in the right place, as outlined by the Ministry of Health’s Health Action Plan, may also help to reduce absenteeism in the private sector and increase rates of work productivity.

**Conclusions**

This economic value analysis demonstrates the significant value that these 5 expanded scope pharmacy services can bring to Ontario’s patients and the health care system as a whole. Based on the findings, it is evident that the long-term economic benefits for government of expanding pharmacists’ scope of authority in Ontario far outweigh the costs. In sum, a net present value of $143.14M ($20.43M-$536.46M) from 2013-2017 is projected for the five program areas for which expanded pharmacist authority was either recently granted or requested. In addition, it is clear that over time, benefits could continue to accrue for the majority of expanded scope areas as demand for pharmacist services and healthcare costs continue to escalate.

Apart from the economic benefits, there are also a number of qualitative benefits that may be realized. For instance, it is anticipated that treatment quality and health outcomes may be enhanced due to improved drug selection, dosing, counseling and monitoring. Additionally, improved productivity, increased access to healthcare and greater convenience can be expected for consumers who may access pharmacists without an appointment even during evenings and weekends. Since Canadians interact with pharmacists more often than with other primary care provider type and because pharmacists provide expertise in drug surveillance which other healthcare professionals are not trained for, enhancing pharmacist prescribing authority is arguably a critical step in improving patient health in Ontario.