

# Reducing Asthma-Related Mortality, Morbidity and Economic Costs

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## ABSTRACT

In 1996, 455 Canadians died from asthma, and asthma costs are high. Inhaled corticosteroids (ICS) are the mainstay of asthma treatment, but compliance to 2/day formulations is a problem. We estimated current asthma costs, and the health and cost savings of new 1/day ICS. Our asthma cost estimates are \$0.864 to \$1.009 billion per year, and new 1/day ICS will increase compliance by 10% to 40%. This will increase the ICS costs themselves, but other costs will decline by more. The estimated net savings will be \$22 to \$117 million per year, and asthma-related deaths will decrease by 5% to 20%.

## Introduction

Inhaled corticosteroids (ICS) are central in the control of asthma. However, compliance with these medications is inadequate, and compliance levels appear to drop off over time. Currently, most ICS are prescribed for 2/day, and reducing this to 1/day is expected to improve compliance. Our study assessed savings to the Canadian economy that would result from the improvements in compliance associated with 1/day ICS therapy.

## Methods

We systematically searched the MEDLINE database for articles published in the last 10 years investigating compliance with 1/day versus 2/day daily medications in chronic illnesses, and the costs of illness related to asthma in Canada. The compliance

improvements associated with 1/day dosages in the treatment of other chronic illnesses were used to estimate the potential compliance improvements that could result from once-daily ICS, since no asthma-specific data were available. Based on this,

we estimated the current economic costs of asthma in Canada, and projected the changes in costs that could be expected from the widespread use of 1/day ICS therapy.

## Results

The range of compliance improvement from 1/day regimens reported in relevant literature was 13.9% to 40%. We estimated that once-daily ICS can be expected to improve compliance by 10% to 40%. Table 1 presents the direct and indirect costs of asthma in Canada in 1999 and 2000, and the cost changes expected from the use of once-daily ICS.

**Table 1. Cost savings that can be expected to occur by increasing compliance 10% to 40%. This increase is expected with the use of once-per-day inhaled corticosteroids, and is based on an extensive review of related literature.**

Category	Unit Costs	Current Cost Estimates	Cost-Saving Estimates
<b>Direct Costs</b>			
Healthcare resources:			
Hospitalization	\$425.00	\$123 M	\$6 M - \$25 M
ER visits	\$170.00	\$32 M - \$122 M	\$2 M - \$24 M
Physician visits	\$ 25.00	\$100 M	\$5 M - \$20 M
Other		\$26 M	\$0.14 M - \$0.6 M
Medications:			
Short-acting $\beta_2$	\$ 16.00	\$75 M	\$4 M - \$16 M
ICS	\$ 50.00	\$125 M	(\$13 M - \$50 M)
Other		\$28 M	\$0
Subtotal (Direct Costs)		\$509 M - \$599 M	\$4 M - \$36 M
<b>Indirect Costs</b>			
Death	\$400,000.00	\$182 M	\$9 M - \$36 M
Non-institutionalized disability		\$92 M - \$118 M	\$5 M - \$24 M
Other		\$81 M - \$109 M	\$4 M - \$22 M
Subtotal (Indirect Costs)		\$355 M - \$409 M	\$18 M - \$82 M
<b>Total</b>		<b>\$864 M - \$1,009 M</b>	<b>\$22 M - \$117 M</b>

Note: Data rounded for clarity.

## CONCLUSIONS

- The direct and indirect costs of asthma to the Canadian economy are between \$0.864 and \$1.009 billion per year.
- A once-daily ICS formulation can be expected to increase compliance by 10% to 40%.
- This improvement would result in savings to the Canadian economy of \$22 to \$117 million per year.
- Substituting 1/day ICS for the current 2/day would increase compliance, reduce the economic costs associated with asthma, improve the quality of life of asthmatics, and save lives.