

The Economic Benefits of Risk Factor Reduction in Manitoba

Tobacco Smoking, Excess Weight and Physical Inactivity

An update to the 2010 report *Making the Case for Primary Prevention: An Economic Analysis of Risk Factors in Manitoba*

October 2013



**HEART &
STROKE**
FOUNDATION



CancerCare
MANITOBA



Canadian
Cancer
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Alliance
for the Prevention of Chronic Disease



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Foreword



The Primary Prevention Syndicate with the support of its funding partners is pleased to facilitate the distribution of ***The Economic Benefits of Risk Factor Reduction in Manitoba.***

The Primary Prevention Syndicate brings together Manitoba organizations and individuals who are committed to ***making primary prevention every body's business.***

Our purpose is to increase the profile of and commitment to primary prevention across government, business and community sectors. We do this by:

- Advocating for and monitoring a 1% annual reduction in three key risk factors common to chronic disease—tobacco, physical inactivity and excess weight.
- Strengthening communication and linkages between prevention research, policy and practice.
- Providing a forum for organizations, individuals, initiatives and resources to work together.

Funding partners for this report are:

- Heart and Stroke Foundation, Manitoba
- Alliance for the Prevention of Chronic Disease
- CancerCare Manitoba
- Canadian Cancer Society
- RBC Foundation

This report builds on an earlier analysis of the economic burden in Manitoba of smoking, physical inactivity and excess weight—***Making the Case for Primary Prevention.*** This 2013 report updates the primary data—specifically, data from the Canadian Community Health Survey (CCHS)—as well as the cost data used in the original report released in September 2010. Note that specific Manitoba data that was used to adjust the CCHS data in the 2010 economic analysis was not available for this report. Adjusting the original analysis to exclude the Manitoba-specific data has little impact on the overall rates of the risk factors, and any resulting comparative analysis.

The original ***Making the Case*** report with its complete background documentation can be accessed at www.heartandstroke.mb.ca/EconomicAnalysis.

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Table of Contents

TABLE OF CONTENTS2

BACKGROUND3

THE PREVALENCE OF THE RISK FACTORS IN MANITOBA5

Tobacco Smoking 5

Excess Weight..... 6

Physical Inactivity 7

ANNUAL ECONOMIC BURDEN IN MANITOBA.....8

ANNUAL ECONOMIC BURDEN BY RISK FACTOR 8

ANNUAL ECONOMIC BURDEN BY RISK FACTOR AND COST CATEGORY PER INDIVIDUAL..... 9

TOTAL ANNUAL ECONOMIC BURDEN BY RISK FACTOR 10

TOTAL ANNUAL ECONOMIC BURDEN BY DISEASE CATEGORY..... 11

THE ECONOMIC BENEFITS OF RISK FACTOR REDUCTION..... 12

KEY ASSUMPTIONS 12

PROJECTED NUMBER OF MANITOBANS WITH THE RISK FACTOR 14

Tobacco Smoking 14

Excess Weight..... 15

Physical Inactivity 16

PROJECTED ECONOMIC BURDEN IN 2031..... 17

No Change in Risk Factor Prevalence (Adjusted 2009/10 CCHS) 17

1% Annual Relative Reduction in Risk Factor Prevalence 19

SUMMARY 22

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Background

In Canada, tobacco smoking, excess weight and physical inactivity are among the top five risk factors in terms of their attributable disease burden in the population.¹

1. **Tobacco smoking**
2. **Excess weight**
3. High blood pressure
4. High blood sugar levels
5. **Physical inactivity**
6. Diet low in fruits
7. Alcohol use

Despite years of successfully reducing the prevalence of tobacco smoking, it remains the number one risk factor with respect to the preventable disease burden.^{2,3,4} Much remains to be done!⁵

We have developed a **unique economic model** which assesses the direct and indirect costs associated with the risk factors of tobacco smoking, excess weight and physical inactivity. The model is unique in that it takes into account (and adjusts for) double counting based on the overlap of multiple risk factors in any one individual (see Figure 1).⁶

¹ Lim SS, Vos T, Flaxman AD et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012; 380(9859): 2224-60.

² Thun MJ, Carter BD, Feskanich D et al. 50-year trends in smoking-related mortality in the United States. *New England Journal of Medicine*. 2013; 368(4): 351-64.

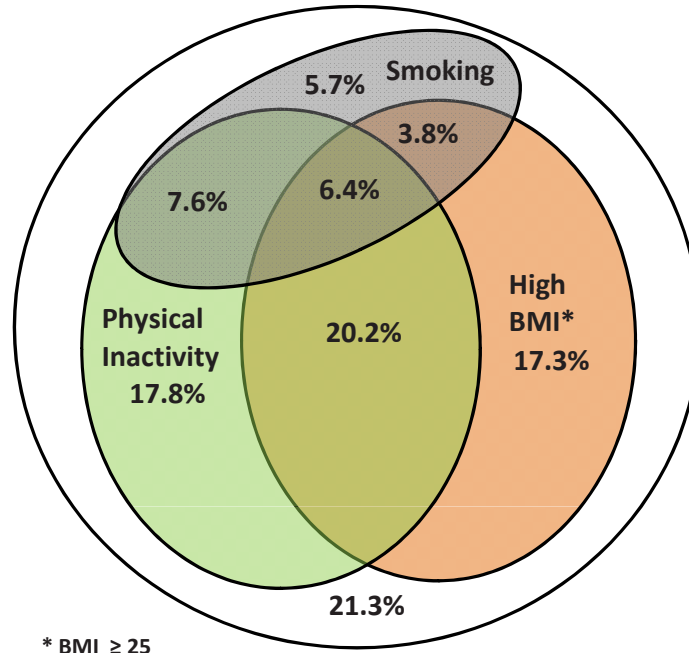
³ Jha P, Ramasundarahettige C, Landsman V et al. 21st-century hazards of smoking and benefits of cessation in the United States. *New England Journal of Medicine*. 2013; 368(4): 341-50.

⁴ Pirie K, Peto R, Reeves GK et al. The 21st century hazards of smoking and benefits of stopping: a prospective study of one million women in the UK. *Lancet*. 2013; 381(9861): 133-41.

⁵ Colditz GA, Wolin KY, Gehlert S. Applying what we know to accelerate cancer prevention. *Science Translational Medicine*. 2012; 4(127): 127rv4.

⁶ Krueger H, Williams D, Ready AE, Trenaman L, Turner D. Improved estimation of the health and economic burden of chronic disease risk factors in Manitoba, Canada. *Chronic Diseases and Injuries in Canada*. 2013; 33(4): 236-46.

Figure 1. Overlap of Risk Factor Exposure in Canada
 Canadian Community Health Survey, Cycle 1.1 (2000)



* BMI ≥ 25

Source: Klein-Geltink et al., *Chronic Diseases in Canada*, 2006.

The model uses a **detailed approach** based on the calculation of population attributable fractions using risk factor prevalence by sex and five-year age groups and the most recent data on the relationship (relative risk) between the risk factor and specific disease categories.

The variable risks and economic burden associated with **tobacco smoking intensity** (light, moderate and heavy smokers⁷) and **levels of excess weight** (overweight and obese⁸) are taken into account using an extension of the basic population attributable fraction formula to address complications that can arise when a polytomous risk factor is involved, that is, one that is made up of more than one level.

In addition to accurately calculating the economic burden associated with these risk factors in any province, the model can be used to **estimate the economic benefits of risk factor reduction** over time.

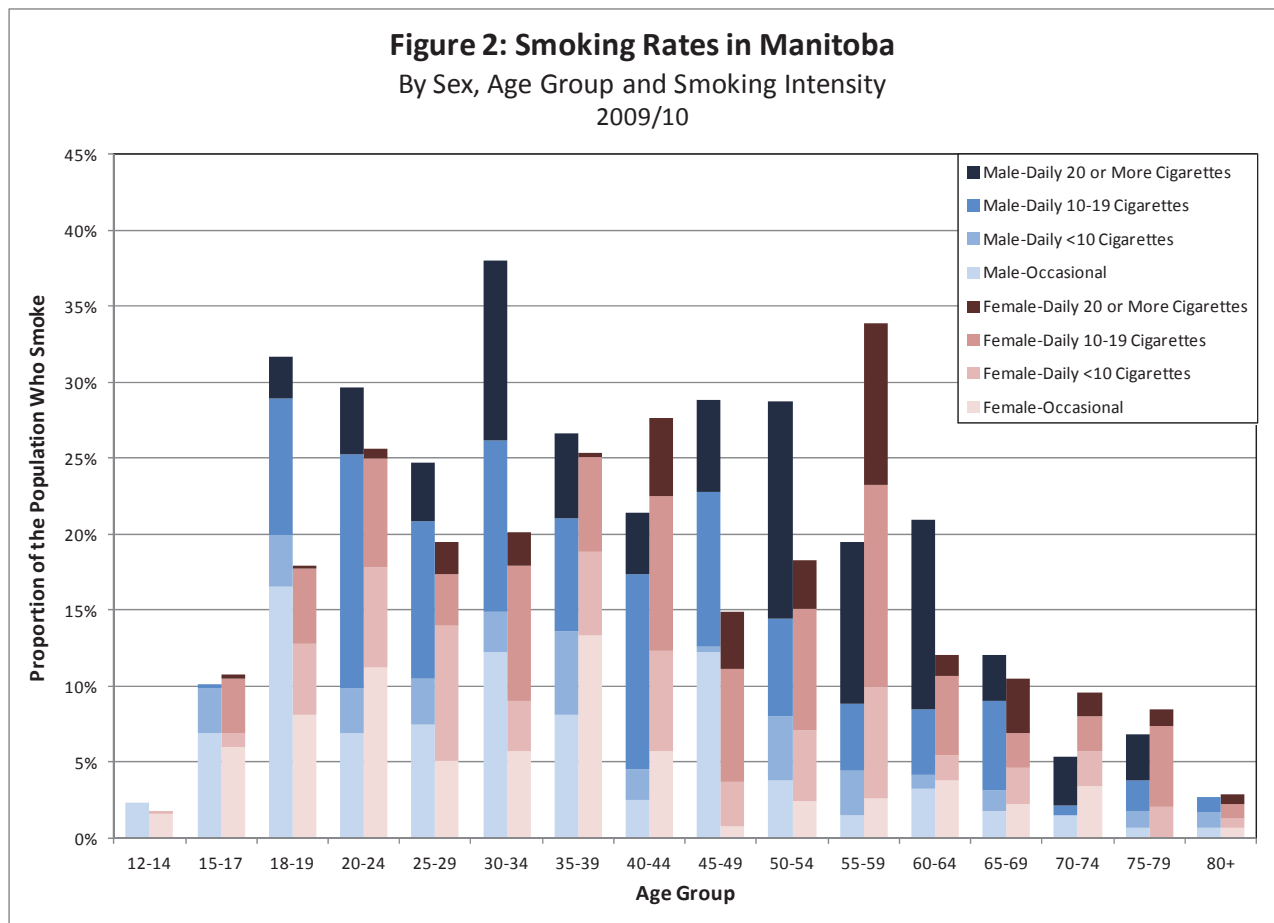
⁷ Data on prevalence is taken from the 2009/10 Canadian Community Health Survey (CCHS). Light tobacco smoking includes all occasional smokers and those who smoke less than 10 cigarettes on a daily basis, moderate tobacco smoking includes those who smoke 10-19 cigarettes on a daily basis, and heavy smoking includes those who smoke 20 or more cigarettes on a daily basis.

⁸ Data on prevalence is taken from the 2009/10 CCHS. Overweight includes individuals with a calculated body mass index (BMI) between 25 kg/m² and 30 kg/m², while obese includes individuals with a calculated BMI ≥30 kg/m². Both calculations are based on self-reported height and weight.

The Prevalence of the Risk Factors in Manitoba

Tobacco Smoking

	<i>Male</i>	<i>Female</i>	<i>Total</i>
Light	6.6%	7.5%	7.0%
Moderate	6.1%	5.1%	5.6%
Heavy	5.3%	2.0%	3.7%
Total	17.9%	14.6%	16.3%



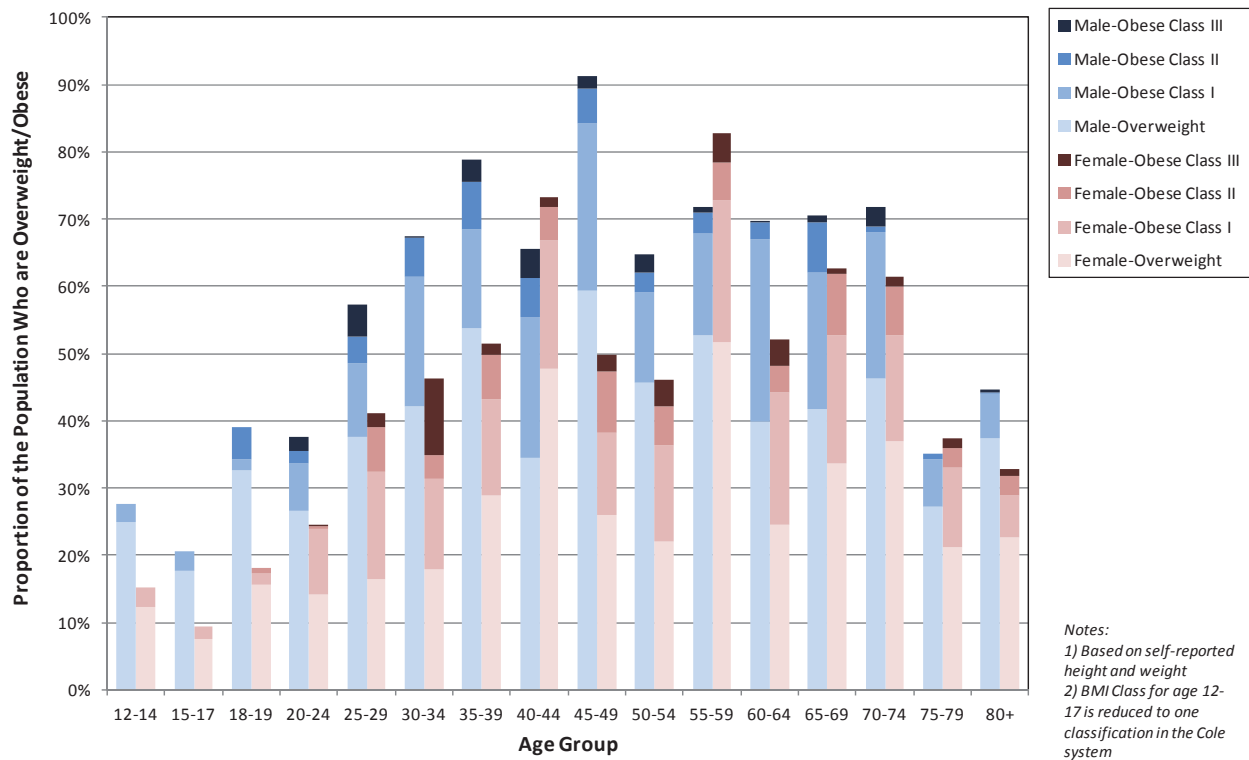
Introduction

Excess Weight

Table 2: Excess Weight in Manitoba 2009/10 Prevalence			
	<i>Male</i>	<i>Female</i>	<i>Total</i>
Overweight	37.5%	23.0%	29.9%
Obese Class I	12.7%	11.7%	12.0%
Obese Class II	3.0%	4.0%	3.4%
Obese Class III	1.6%	2.2%	1.9%
Subtotal Obese	17.3%	17.9%	17.3%
Total Excess Weight	54.8%	40.9%	47.2%

Figure 3: Overweight and Obesity Rates in Manitoba

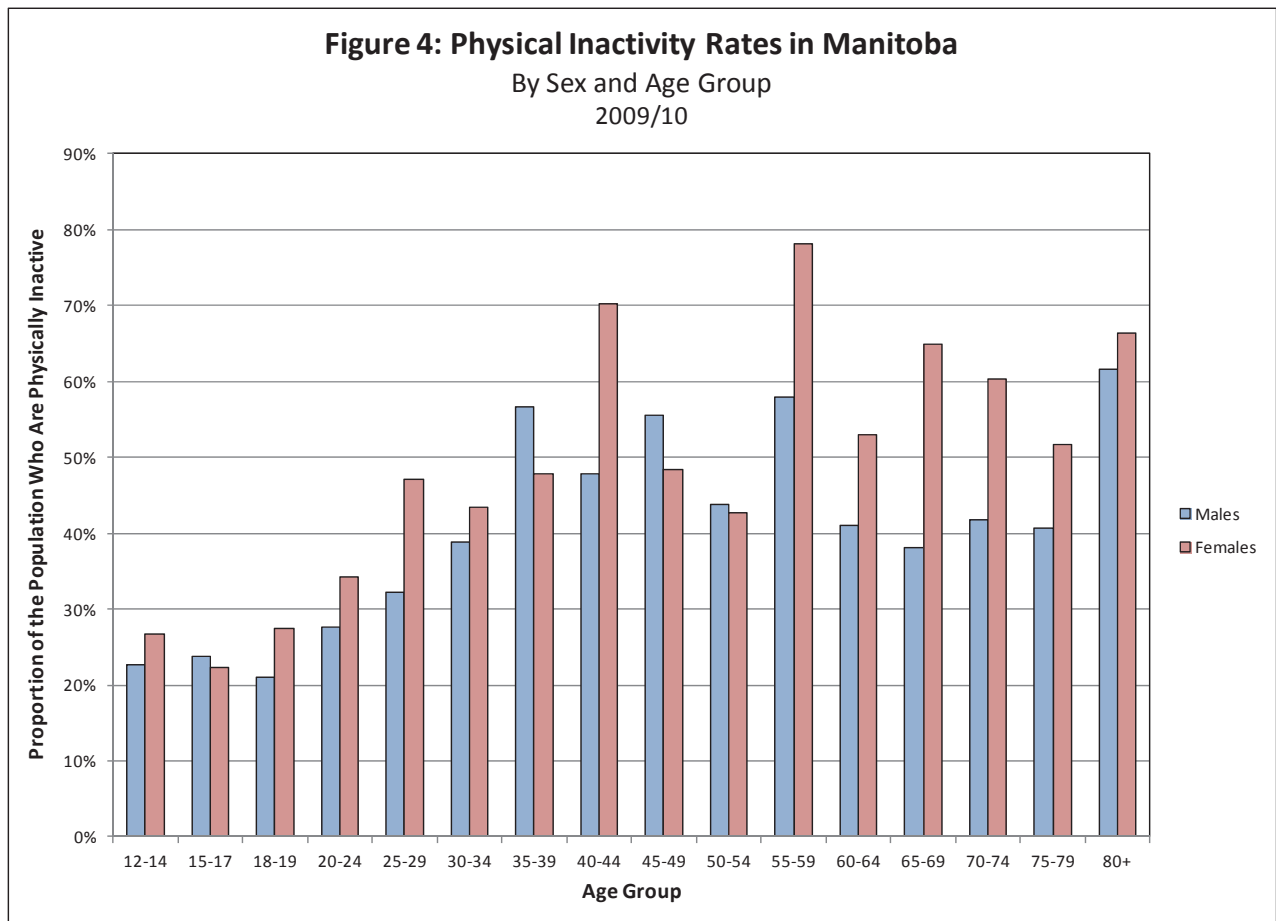
By Sex, Age Group and Level of Obesity
2009/10



Physical Inactivity

**Table 3: Physical Inactivity in Manitoba
2009/10 Prevalence**

	Male	Female	Total
Physically Inactive	38.4%	45.8%	42.1%



Annual Economic Burden in Manitoba

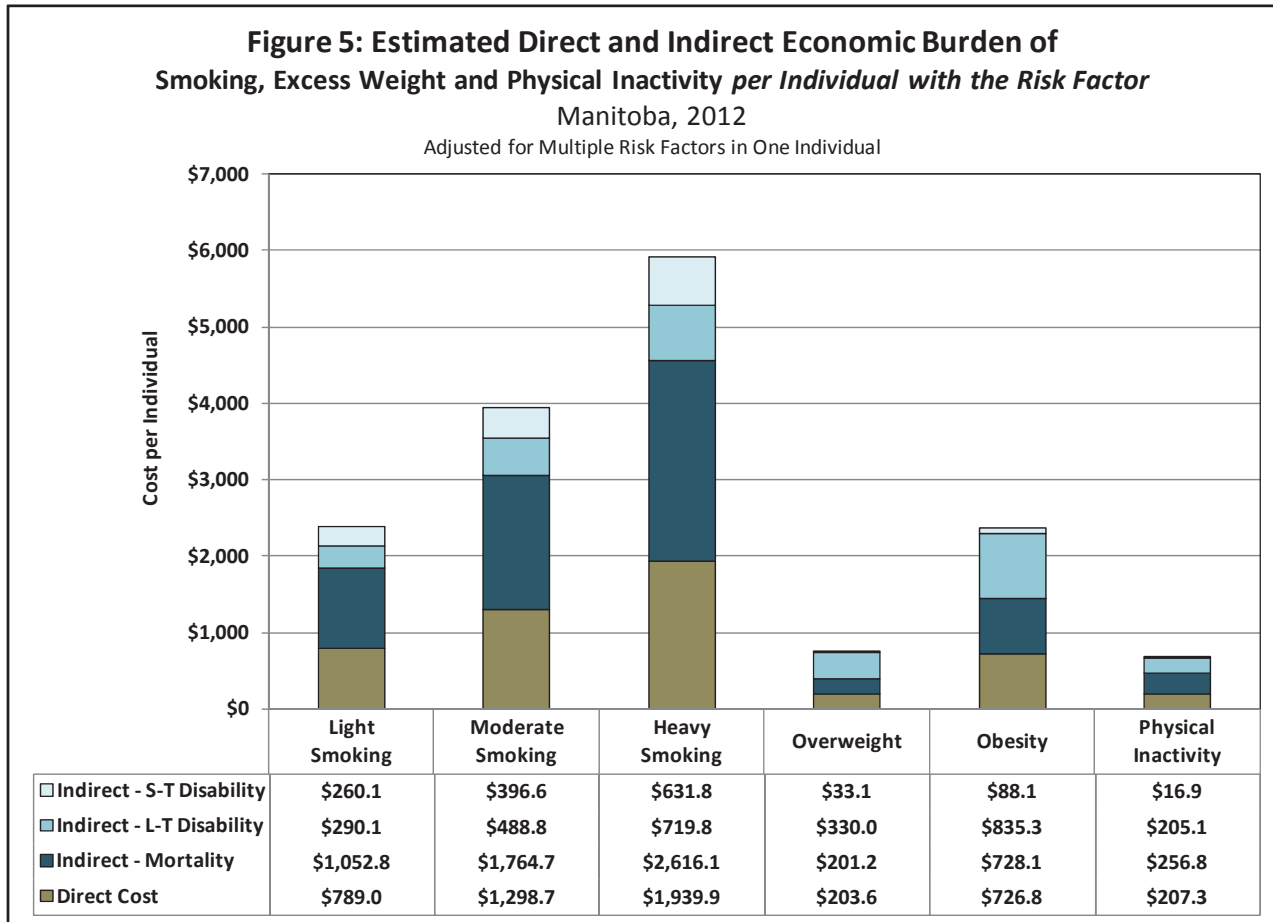
Annual Economic Burden by Risk Factor

Table 4: Estimated Prevalence of RFs, Total Economic Burden for Multifactorial System, and Disaggregated Costs by RF
Manitoba, 2012, By Sex
Adjusted for Multiple RFs in One Individual

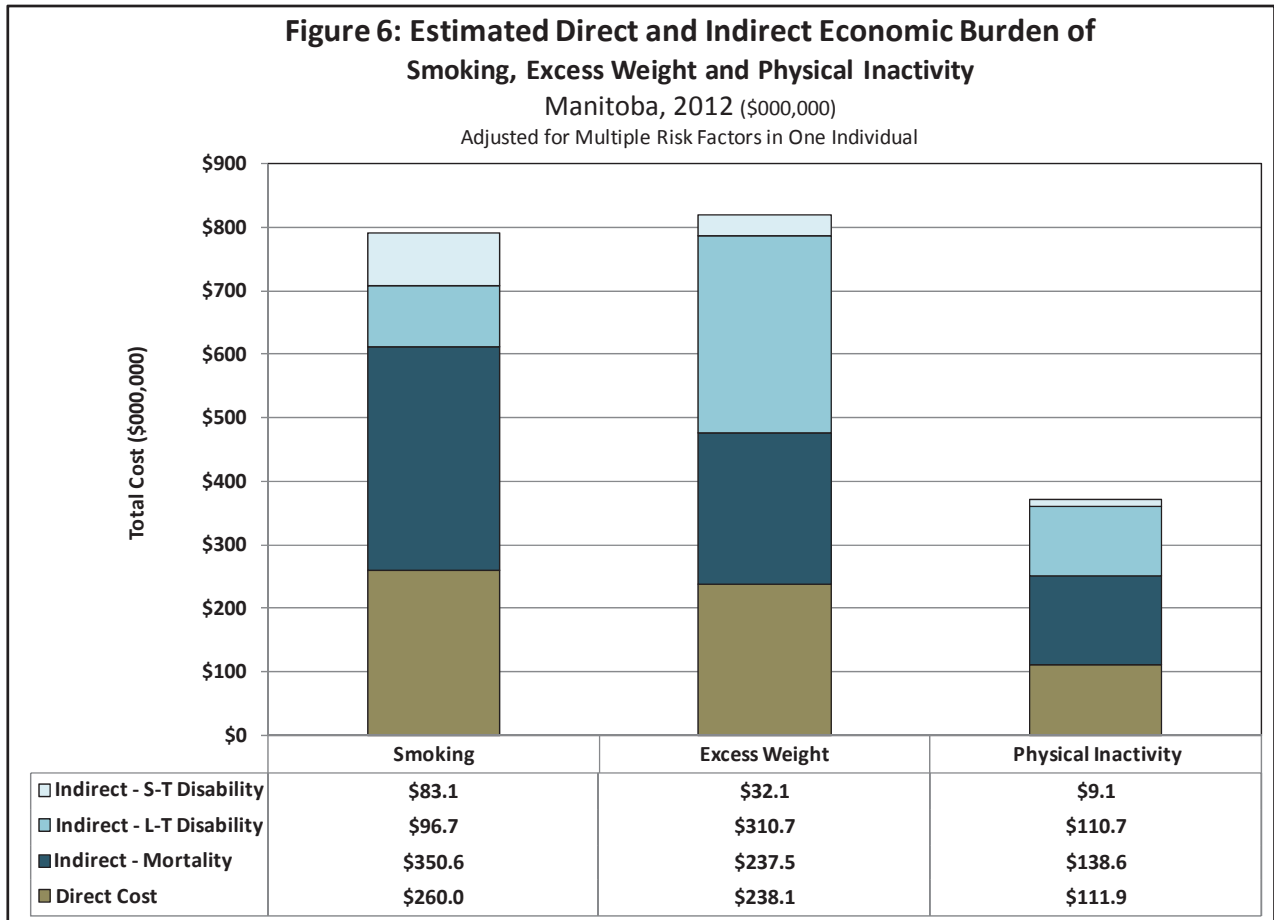
	% Population with RF	# Individuals with RF	Direct Cost per Individual with RF (\$'s)	Indirect Cost per Individual with RF (\$'s)	Total Cost per Individual with RF (\$'s)	Total Direct Cost of RF (million\$)	Total Indirect Cost of RF (million\$)	Total Cost of RF (million\$)
Males								
<i>Smokers</i>								
Light	6.6%	44,193	\$861	\$1,779	\$2,640	\$38	\$79	\$117
Moderate	6.1%	39,636	\$1,359	\$2,814	\$4,173	\$54	\$112	\$165
Heavy	5.3%	33,352	\$1,911	\$3,923	\$5,834	\$64	\$131	\$195
Subtotal - Male Smokers	17.9%	117,180	\$1,328	\$2,739	\$4,068	\$156	\$321	\$477
<i>Excess Weight</i>								
Overweight	37.5%	238,647	\$156	\$461	\$617	\$37	\$110	\$147
Obese	17.3%	109,116	\$568	\$1,367	\$1,934	\$62	\$149	\$211
Subtotal - Male Excess Weight	54.8%	347,763	\$285	\$745	\$1,030	\$99	\$259	\$358
<i>Inactive</i>	38.4%	243,631	\$198	\$428	\$626	\$48	\$104	\$152
Subtotal						\$303	\$684	\$987
Females								
<i>Smokers</i>								
Light	7.5%	48,635	\$724	\$1,443	\$2,166	\$35	\$70	\$105
Moderate	5.1%	33,254	\$1,226	\$2,455	\$3,682	\$41	\$82	\$122
Heavy	2.0%	14,129	\$2,008	\$4,074	\$6,082	\$28	\$58	\$86
Subtotal - Female Smokers	14.6%	96,018	\$1,087	\$2,181	\$3,267	\$104	\$209	\$314
<i>Excess Weight</i>								
Overweight	23.0%	147,236	\$280	\$732	\$1,012	\$41	\$108	\$149
Obesity	17.9%	110,393	\$884	\$1,933	\$2,817	\$98	\$213	\$311
Subtotal - Female Excess Weight	40.9%	257,630	\$539	\$1,247	\$1,786	\$139	\$321	\$460
<i>Inactive</i>	45.8%	296,115	\$215	\$521	\$736	\$64	\$154	\$218
Subtotal						\$307	\$685	\$992
Both Sexes								
<i>Smokers</i>								
Light	7.0%	92,828	\$789	\$1,603	\$2,392	\$73	\$149	\$222
Moderate	5.6%	72,890	\$1,299	\$2,650	\$3,949	\$95	\$193	\$288
Heavy	3.7%	47,481	\$1,940	\$3,968	\$5,908	\$92	\$188	\$280
Subtotal - Smokers	16.3%	213,198	\$1,220	\$2,488	\$3,707	\$260	\$530	\$790
<i>Excess Weight</i>								
Overweight	29.9%	385,883	\$204	\$564	\$768	\$79	\$218	\$296
Obesity	17.3%	219,510	\$727	\$1,652	\$2,378	\$160	\$363	\$522
Subtotal - Excess Weight	47.2%	605,392	\$393	\$958	\$1,352	\$238	\$580	\$818
<i>Inactive</i>	42.1%	539,746	\$207	\$479	\$686	\$112	\$258	\$370
Total						\$610	\$1,369	\$1,979

RF = Risk Factor

Annual Economic Burden by Risk Factor and Cost Category per Individual



Total Annual Economic Burden by Risk Factor



Total Annual Economic Burden by Disease Category

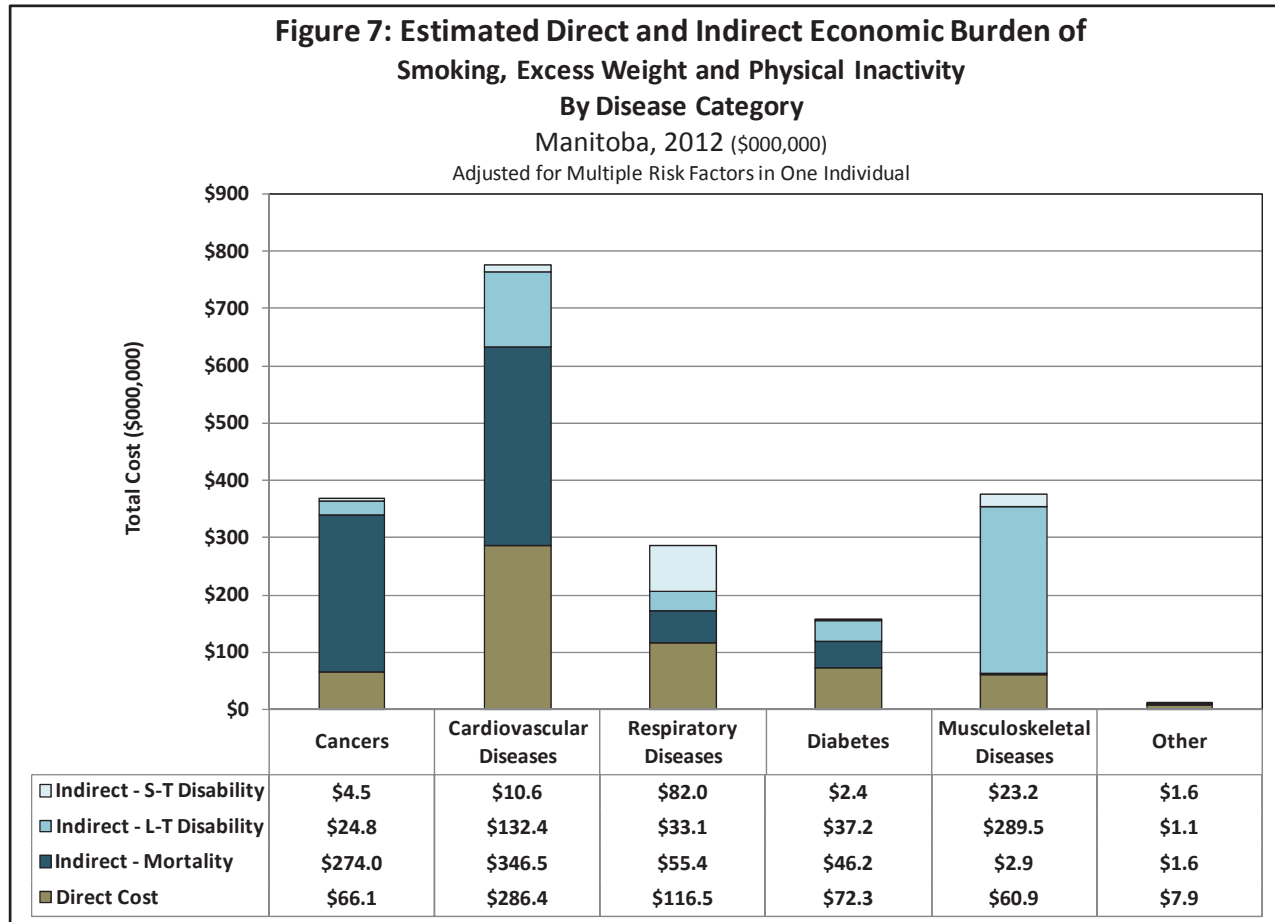


Table 5: Economic Burden by Disease Category
 (in \$,000,000)

	Cancers	Cardiovascular Diseases	Respiratory Diseases	Diabetes	Musculoskeletal Diseases	Other	Total
Direct Cost	\$66	\$286	\$116	\$72	\$61	\$8	\$610
Indirect - Mortality	\$274	\$347	\$55	\$46	\$3	\$2	\$727
Indirect - L-T Disability	\$25	\$132	\$33	\$37	\$289	\$1	\$518
Indirect - S-T Disability	\$4	\$11	\$82	\$2	\$23	\$2	\$124
Total	\$369	\$776	\$287	\$158	\$376	\$12	\$1,979
% of Total	18.7%	39.2%	14.5%	8.0%	19.0%	0.6%	100.0%

**Other includes cirrhosis of alcoholic liver and gallbladder disease*

The Economic Benefits of Risk Factor Reduction

Key Assumptions

- 20 year timeframe from 2012 to 2031
- Population projections based on Statistics Canada, Population Projections for Canada, Provinces and Territories, 2009 to 2036, Catalogue No. 91-520-X, using the medium-growth - historical trends (1981 to 2008) scenario (M1), July 1st
- Risk factor prevalence by age and gender based on the combined 2009 and 2010 Canadian Community Health Survey adjusted for overweight/obesity and physical inactivity in children and youth
- 1% relative annual reduction in the risk factors of tobacco smoking, physical inactivity, overweight and obesity
- Use constant 2012 dollars (i.e. do not adjust for projected inflation) in order to clearly identify changes in the economic burden associated with changing risk factor prevalence (rather than confusing these results with inflationary increases)
- Obese individuals move into the overweight category; overweight individuals move into the healthy weight category
- The benefits associated with physical activity and moving to a healthier weight accrue immediately
- The benefits of smoking cessation accrue as per Figure 8 (see also Table 6 for females and Table 7 for males)

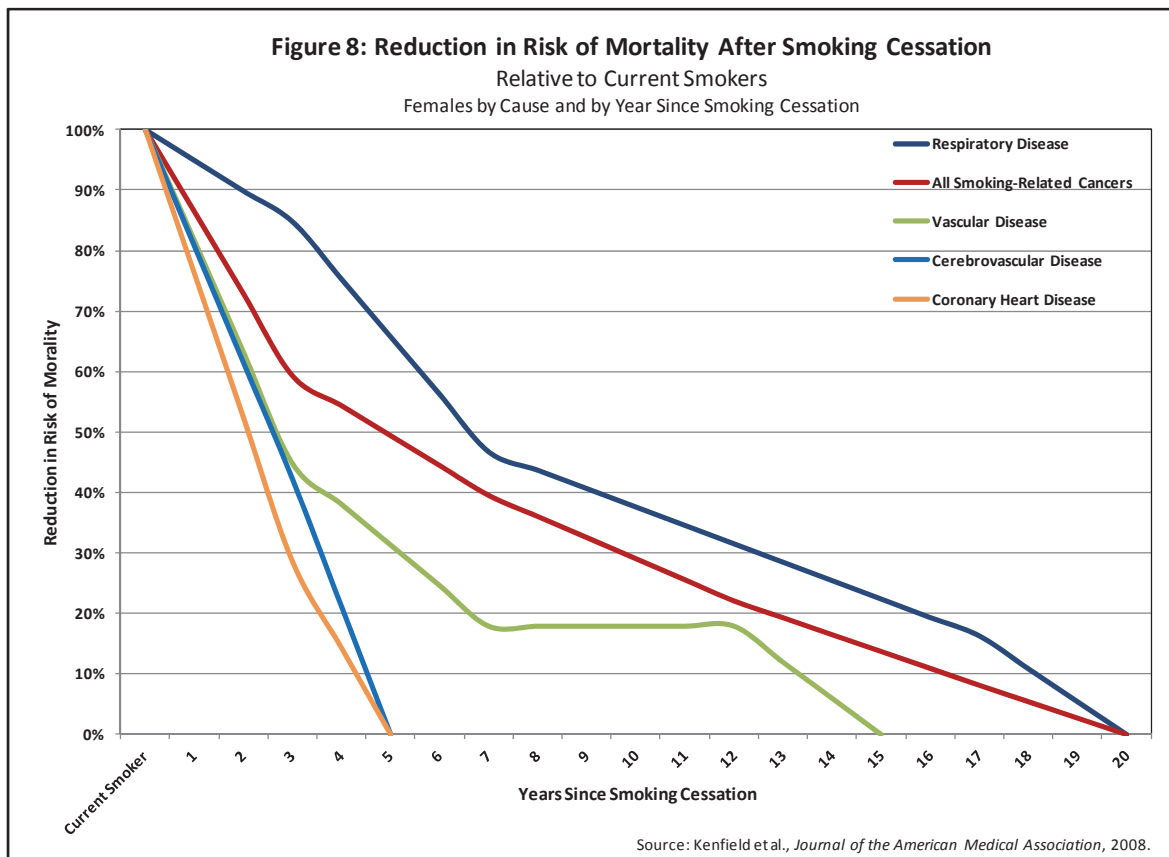


Table 6: Reduction in Total (Direct + Indirect) Costs After Smoking Cessation
Females, by Year Since Smoking Cessation

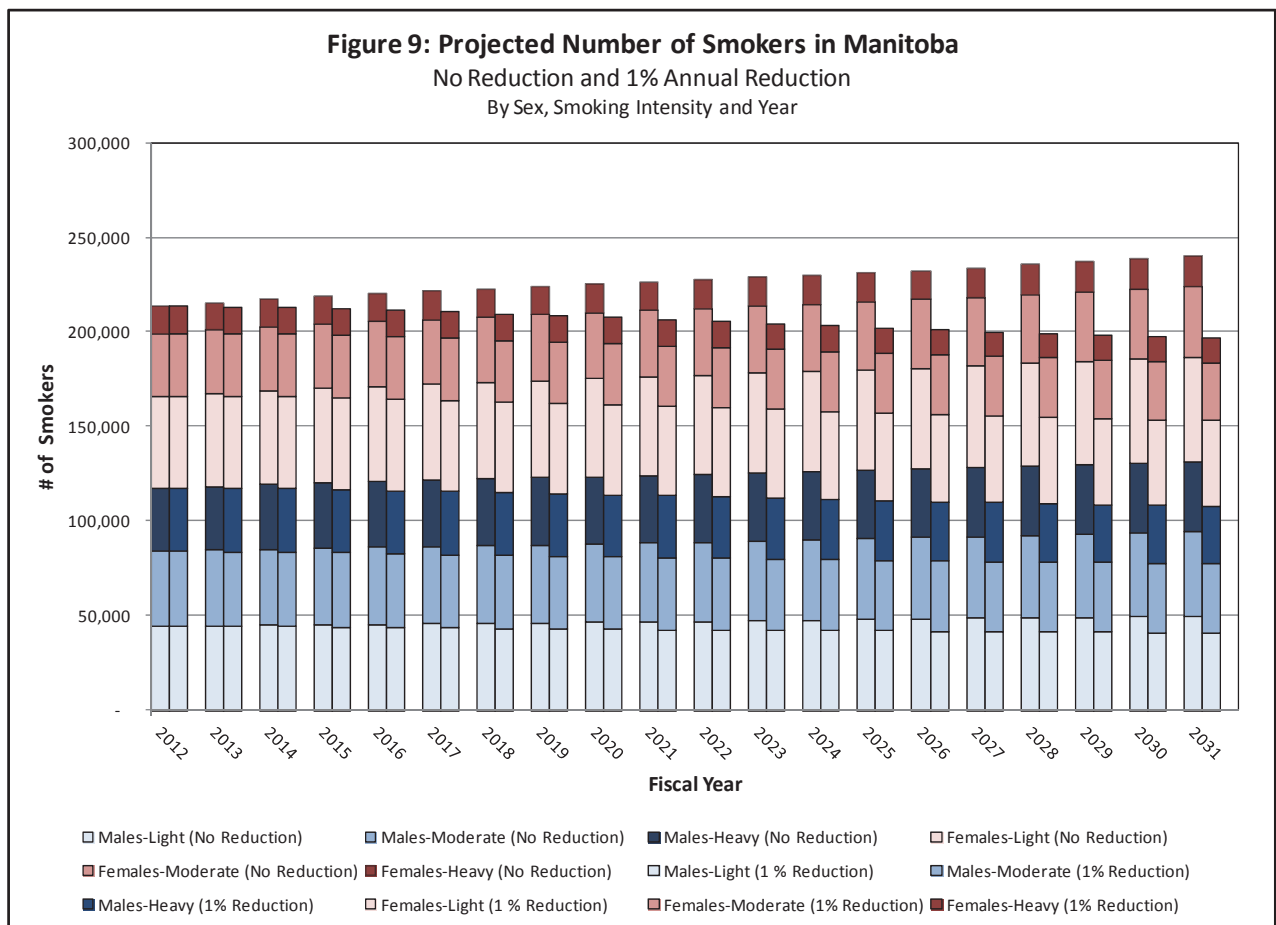
Years Since Quitting	Direct	Indirect			Subtotal Indirect	Total (Direct + Indirect)	% of \$ vs. Smoker
		Mortality	Disability				
			Long-Term	Short-Term			
Current Smoker	\$1,087	\$1,422	\$403	\$356	\$2,181	\$3,267	100%
1	\$939	\$1,205	\$343	\$334	\$1,882	\$2,821	86%
2	\$792	\$988	\$283	\$312	\$1,583	\$2,375	73%
3	\$645	\$771	\$223	\$291	\$1,284	\$1,929	59%
4	\$522	\$629	\$173	\$256	\$1,058	\$1,579	48%
5	\$398	\$487	\$123	\$222	\$831	\$1,230	38%
6	\$345	\$432	\$106	\$190	\$728	\$1,072	33%
7	\$291	\$376	\$90	\$158	\$624	\$915	28%
8	\$270	\$345	\$83	\$148	\$576	\$847	26%
9	\$250	\$315	\$77	\$137	\$529	\$779	24%
10	\$229	\$284	\$71	\$127	\$482	\$711	22%
11	\$209	\$253	\$64	\$117	\$434	\$643	20%
12	\$188	\$223	\$58	\$106	\$387	\$575	18%
13	\$168	\$196	\$52	\$96	\$344	\$512	16%
14	\$148	\$170	\$46	\$85	\$301	\$449	14%
15	\$129	\$144	\$39	\$75	\$258	\$387	12%
16	\$109	\$118	\$33	\$65	\$216	\$325	10%
17	\$90	\$92	\$27	\$54	\$174	\$264	8%
18	\$60	\$61	\$18	\$36	\$116	\$176	5%
19	\$30	\$31	\$9	\$18	\$58	\$88	3%
20	\$0	\$0	\$0	\$0	\$0	\$0	0%

Table 7: Reduction in Total (Direct + Indirect) Costs After Smoking Cessation
Males, by Year Since Smoking Cessation

Years Since Quitting	Direct	Indirect			Subtotal Indirect	Total (Direct + Indirect)	% of \$ vs. Smoker
		Mortality	Disability				
			Long-Term	Short-Term			
Current Smoker	\$1,328	\$1,826	\$495	\$417	\$2,739	\$4,068	100%
1	\$1,153	\$1,545	\$420	\$392	\$2,356	\$3,510	86%
2	\$978	\$1,263	\$344	\$366	\$1,973	\$2,952	73%
3	\$803	\$982	\$269	\$340	\$1,590	\$2,393	59%
4	\$647	\$809	\$209	\$300	\$1,318	\$1,965	48%
5	\$491	\$637	\$150	\$259	\$1,046	\$1,537	38%
6	\$424	\$565	\$130	\$222	\$917	\$1,342	33%
7	\$358	\$493	\$110	\$185	\$788	\$1,146	28%
8	\$333	\$453	\$102	\$173	\$728	\$1,060	26%
9	\$308	\$412	\$94	\$161	\$667	\$975	24%
10	\$283	\$372	\$86	\$148	\$607	\$889	22%
11	\$257	\$331	\$79	\$136	\$546	\$804	20%
12	\$232	\$291	\$71	\$124	\$486	\$718	18%
13	\$208	\$256	\$63	\$112	\$431	\$639	16%
14	\$184	\$221	\$55	\$100	\$376	\$560	14%
15	\$160	\$186	\$48	\$88	\$322	\$481	12%
16	\$136	\$152	\$40	\$76	\$268	\$405	10%
17	\$113	\$118	\$33	\$64	\$215	\$328	8%
18	\$75	\$79	\$22	\$42	\$143	\$218	5%
19	\$38	\$39	\$11	\$21	\$72	\$109	3%
20	\$0	\$0	\$0	\$0	\$0	\$0	0%

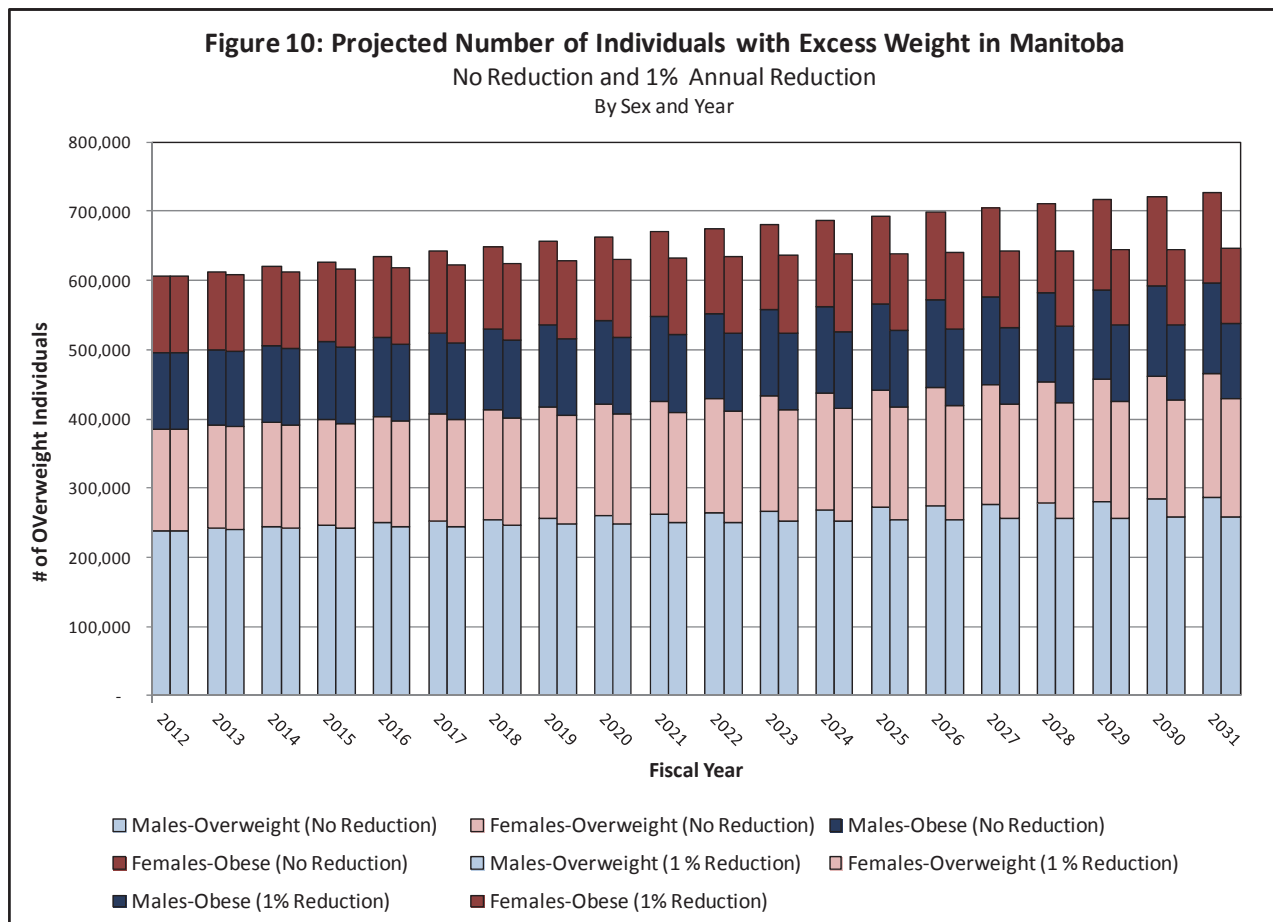
Projected Number of Manitobans with the Risk Factor
Tobacco Smoking

Table 8: Tobacco Smoking in Manitoba						
2031 Projections						
	<u>No Reduction</u>			<u>1% Reduction</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Light	49,541	55,366	104,907	40,620	45,413	86,033
Moderate	44,613	37,534	82,147	36,582	30,779	67,361
Heavy	36,938	15,930	52,868	30,121	13,042	43,163
Total	131,092	108,830	239,922	107,323	89,234	196,557



Excess Weight

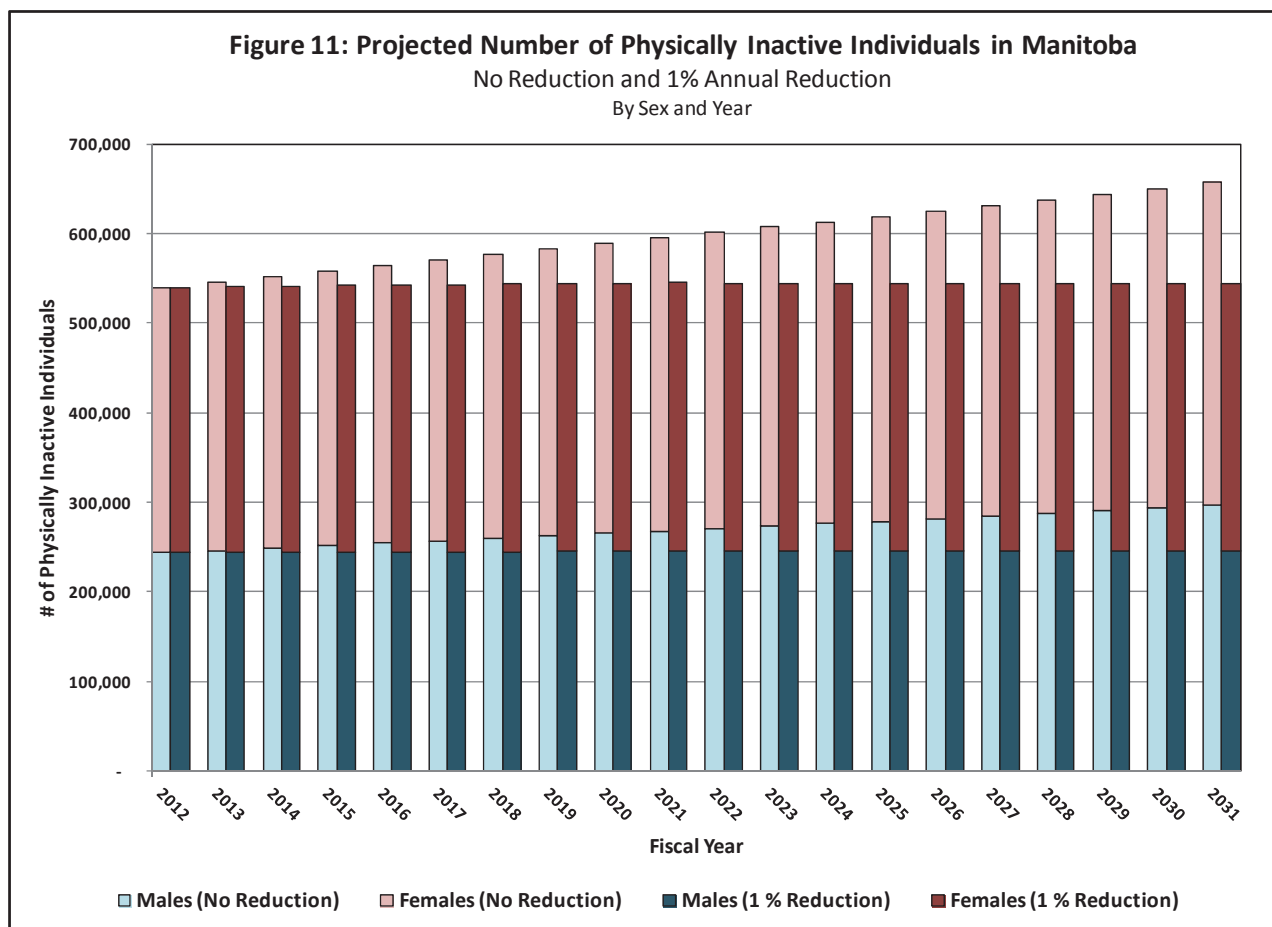
Table 9: Individuals with Excess Weight in Manitoba 2031 Projections						
	<u>No Reduction</u>			<u>1% Reduction</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Overweight	285,988	179,046	465,034	258,968	171,160	430,128
Obese	131,112	131,341	262,453	107,953	108,018	215,971
Total	417,100	310,387	727,487	366,921	279,178	646,099



Evidence of Population-Based Risk Factor Reduction

Physical Inactivity

Table 10: Physically Inactive Individuals in Manitoba 2031 Projections						
	<u>No Reduction</u>			<u>1% Reduction</u>		
	<u>Male</u>	<u>Female</u>	<u>Total</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
Physically Inactive	296,519	360,271	656,790	245,559	298,174	543,733



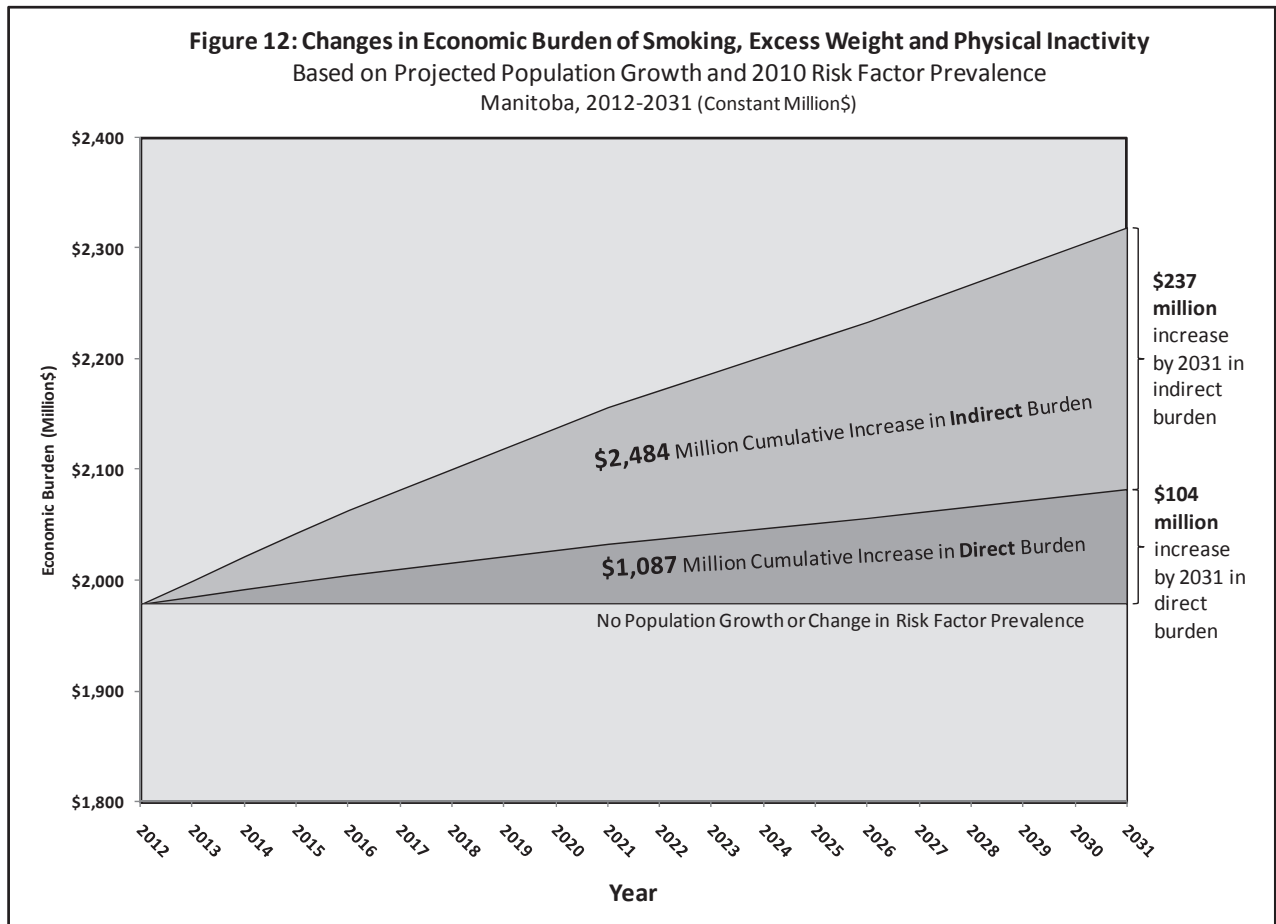
Projected Economic Burden in 2031

No Change in Risk Factor Prevalence (Adjusted 2009/10 CCHS)

The annual economic burden would increase from \$1,979 million dollars in 2012 (see Table 4) to \$2,319 million dollars in 2031 (see Table 11 and Figure 12). Remember that these dollars are not adjusted for inflation so this increase is totally attributable to population growth.

	% Population with RF	# Individuals with RF	Direct Cost per Individual with RF (\$'s)	Indirect Cost per Individual with RF (\$'s)	Total Cost per Individual with RF (\$'s)	Total Direct Cost of RF (M\$'s)	Total Indirect Cost of RF (M\$'s)	Total Cost of RF (M\$'s)
Males								
<i>Smokers</i>								
Light	6.5%	49,541	\$861	\$1,779	\$2,640	\$43	\$88	\$131
Moderate	5.9%	44,613	\$1,359	\$2,814	\$4,173	\$61	\$126	\$186
Heavy	4.9%	36,938	\$1,911	\$3,923	\$5,834	\$71	\$145	\$215
Subtotal - Male Smokers	17.3%	131,093	\$1,326	\$2,735	\$4,062	\$174	\$359	\$532
<i>Excess Weight</i>								
Overweight	37.8%	285,988	\$156	\$461	\$617	\$45	\$132	\$176
Obese	17.3%	131,112	\$568	\$1,367	\$1,934	\$74	\$179	\$254
Subtotal - Male Excess Weight	55.1%	417,101	\$286	\$746	\$1,031	\$119	\$311	\$430
<i>Inactive</i>	39.1%	296,519	\$198	\$428	\$626	\$59	\$127	\$186
Subtotal						\$352	\$796	\$1,148
Females								
<i>Smokers</i>								
Light	7.3%	55,366	\$724	\$1,443	\$2,166	\$40	\$80	\$120
Moderate	5.0%	37,534	\$1,226	\$2,455	\$3,682	\$46	\$92	\$138
Heavy	2.1%	15,930	\$2,008	\$4,074	\$6,082	\$32	\$65	\$97
Subtotal - Female Smokers	14.4%	108,831	\$1,085	\$2,177	\$3,262	\$118	\$237	\$355
<i>Excess Weight</i>								
Overweight	24.2%	179,046	\$280	\$732	\$1,012	\$50	\$131	\$181
Obesity	17.8%	131,341	\$884	\$1,933	\$2,817	\$116	\$254	\$370
Subtotal - Female Excess Weight	42.0%	310,387	\$536	\$1,240	\$1,776	\$166	\$385	\$551
<i>Inactive</i>	47.6%	360,271	\$215	\$521	\$736	\$77	\$188	\$265
Subtotal						\$362	\$809	\$1,171
Both Sexes								
<i>Smokers</i>								
Light	6.9%	104,907	\$789	\$1,602	\$2,390	\$83	\$168	\$251
Moderate	5.4%	82,147	\$1,299	\$2,650	\$3,949	\$107	\$218	\$324
Heavy	3.5%	52,869	\$1,940	\$3,968	\$5,909	\$103	\$210	\$312
Subtotal - Smokers	15.8%	239,923	\$1,217	\$2,482	\$3,699	\$292	\$596	\$887
<i>Excess Weight</i>								
Overweight	31.1%	465,034	\$204	\$565	\$769	\$95	\$263	\$358
Obesity	17.5%	262,453	\$726	\$1,650	\$2,376	\$191	\$433	\$624
Subtotal - Excess Weight	48.6%	727,487	\$392	\$957	\$1,349	\$285	\$696	\$981
<i>Inactive</i>	43.4%	656,790	\$207	\$479	\$686	\$136	\$314	\$451
Total						\$714	\$1,606	\$2,319

RF = Risk Factor



1% Annual Relative Reduction in Risk Factor Prevalence

The annual economic burden in 2031 of \$2,319 million dollars (see Table 11) would be reduced to \$1,990 million dollars (see Table 12), an annual reduction of \$329 million dollars in 2031. The cumulative reduction over the 20 year period is \$3,040 million dollars (see Figure 13). Of this amount, \$976 million dollars is attributable to the reduction in the number of Manitobans who smoke tobacco, \$1,312 million dollars is attributable to the reduction in the number of Manitobans with excess weight and \$752 million dollars is attributable to the reduction in the number of Manitobans who are physically inactive (see Figure 14 and Table 13).

	% Population with RF	# Individuals with RF	Direct Cost per Individual with RF (\$'s)	Indirect Cost per Individual with RF (\$'s)	Total Cost per Individual with RF (\$'s)	Total Direct Cost of RF (M\$'s)	Total Indirect Cost of RF (M\$'s)	Total Cost of RF (M\$'s)
Males								
<i>Smokers</i>								
Light	5.4%	40,620	\$910	\$1,887	\$2,797	\$37	\$77	\$114
Moderate	4.8%	36,582	\$1,437	\$2,983	\$4,419	\$53	\$109	\$162
Heavy	4.0%	30,121	\$2,022	\$4,165	\$6,188	\$61	\$125	\$186
Subtotal - Male Smokers	14.2%	107,322	\$1,402	\$2,900	\$4,302	\$150	\$311	\$462
<i>Excess Weight</i>								
Overweight	34.2%	258,968	\$156	\$461	\$617	\$40	\$119	\$160
Obese	14.3%	107,953	\$568	\$1,367	\$1,934	\$61	\$148	\$209
Subtotal - Male Excess Weight	48.4%	366,922	\$277	\$727	\$1,005	\$102	\$267	\$369
<i>Inactive</i>								
Subtotal	32.4%	245,559	\$198	\$428	\$626	\$49	\$105	\$154
						\$301	\$683	\$984
Females								
<i>Smokers</i>								
Light	6.0%	45,413	\$769	\$1,534	\$2,303	\$35	\$70	\$105
Moderate	4.1%	30,779	\$1,303	\$2,610	\$3,913	\$40	\$80	\$120
Heavy	1.7%	13,042	\$2,134	\$4,335	\$6,469	\$28	\$57	\$84
Subtotal - Female Smokers	11.8%	89,233	\$1,152	\$2,315	\$3,467	\$103	\$207	\$309
<i>Excess Weight</i>								
Overweight	23.2%	171,160	\$280	\$732	\$1,012	\$48	\$125	\$173
Obesity	14.6%	108,018	\$884	\$1,933	\$2,817	\$96	\$209	\$304
Subtotal - Female Excess Weight	37.8%	279,178	\$514	\$1,197	\$1,711	\$144	\$334	\$478
<i>Inactive</i>								
Subtotal	39.4%	298,174	\$215	\$521	\$736	\$64	\$155	\$219
						\$310	\$696	\$1,006
Both Sexes								
<i>Smokers</i>								
Light	5.7%	86,033	\$835	\$1,701	\$2,536	\$72	\$146	\$218
Moderate	4.4%	67,360	\$1,375	\$2,813	\$4,188	\$93	\$189	\$282
Heavy	2.9%	43,162	\$2,056	\$4,217	\$6,273	\$89	\$182	\$271
Subtotal - Smokers	13.0%	196,556	\$1,289	\$2,634	\$3,923	\$253	\$518	\$771
<i>Excess Weight</i>								
Overweight	28.7%	430,128	\$206	\$569	\$774	\$88	\$245	\$333
Obesity	14.4%	215,972	\$726	\$1,650	\$2,376	\$157	\$356	\$513
Subtotal - Excess Weight	43.2%	646,099	\$380	\$930	\$1,310	\$245	\$601	\$846
<i>Inactive</i>								
Subtotal	35.9%	543,734	\$207	\$479	\$686	\$113	\$260	\$373
Total						\$611	\$1,379	\$1,990

RF = Risk Factor

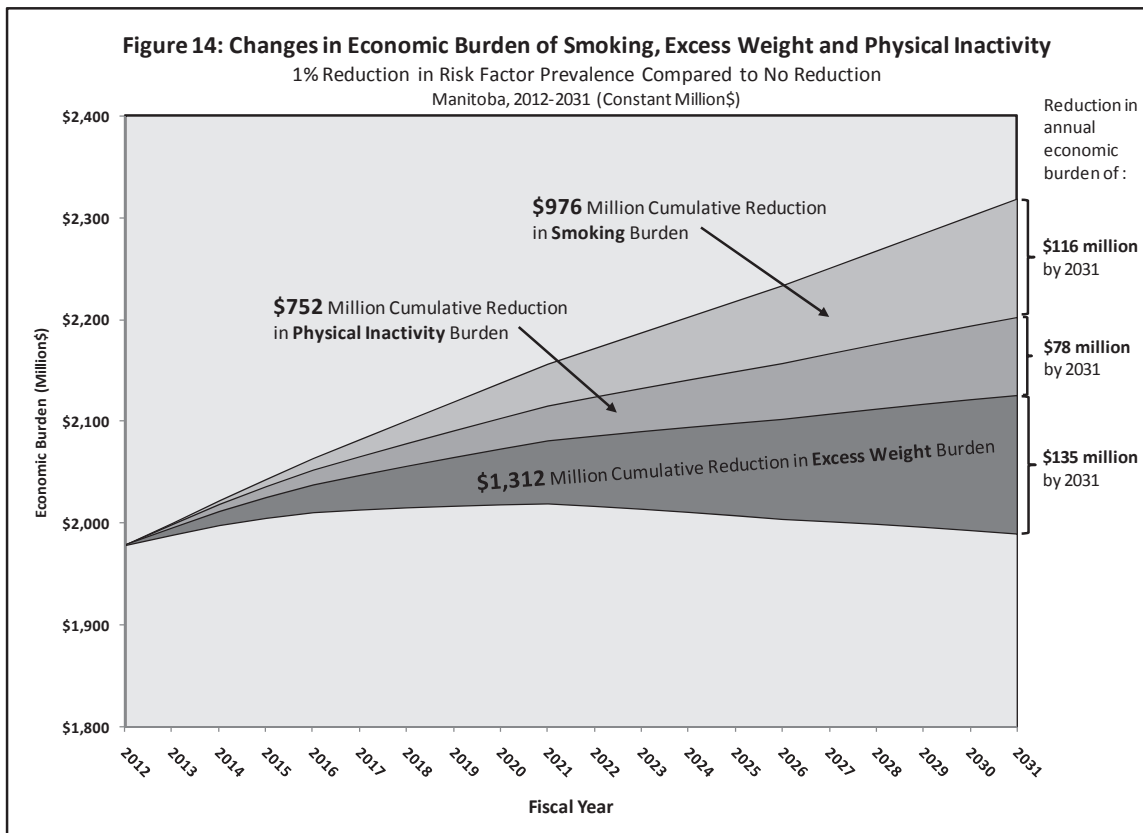
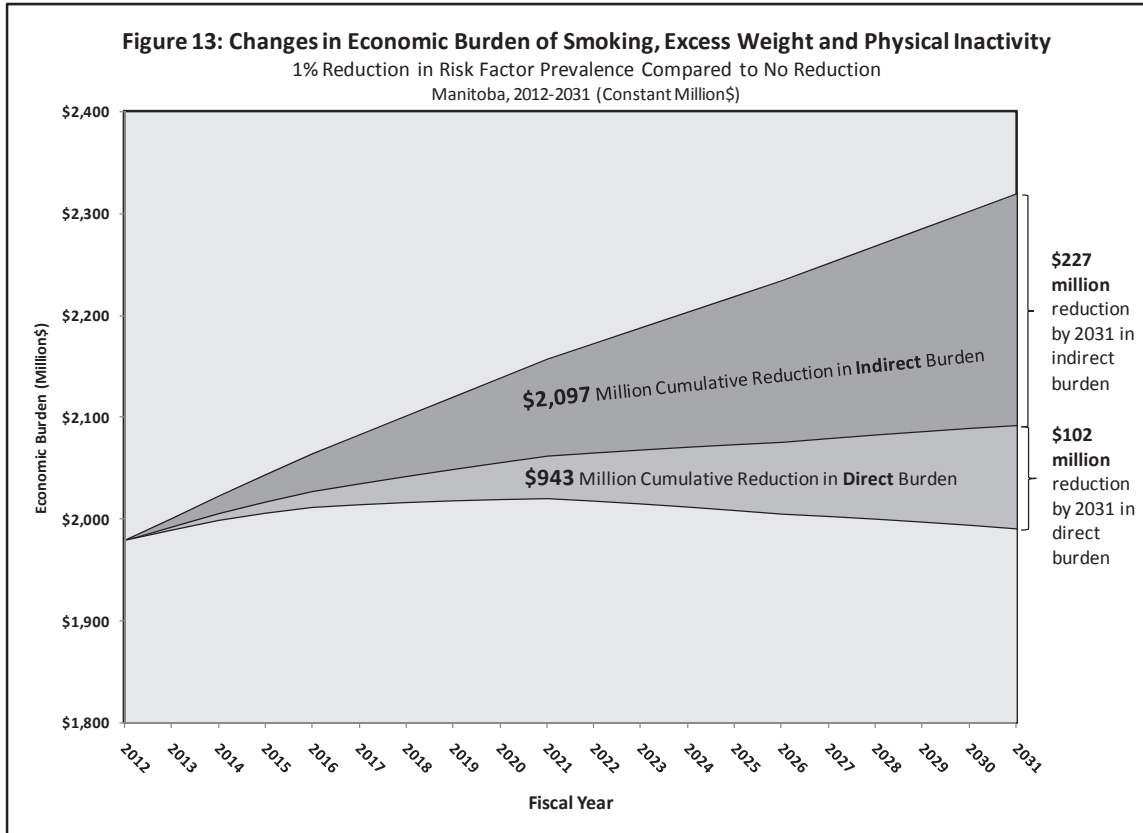


Table 13: Reduction in Economic Burden of Smoking, Excess Weight and Physical Inactivity
 1% Annual Reduction in Risk Factor Prevalence Compared to No Reduction
 Manitoba, 2012-2031 (Constant Million\$)

Year	Smoking	Excess Weight	Physical Inactivity	Combined
2012	\$0.0	\$0.0	\$0.0	\$0.0
2013	\$1.2	\$6.4	\$3.7	\$11.2
2014	\$3.5	\$12.9	\$7.4	\$23.8
2015	\$7.0	\$19.5	\$11.2	\$37.8
2016	\$11.4	\$26.2	\$15.1	\$52.7
2017	\$16.7	\$33.0	\$18.9	\$68.6
2018	\$22.4	\$39.9	\$22.9	\$85.1
2019	\$28.4	\$46.8	\$26.8	\$102.0
2020	\$34.7	\$53.8	\$30.8	\$119.3
2021	\$41.2	\$60.9	\$34.9	\$136.9
2022	\$47.8	\$68.0	\$39.0	\$154.8
2023	\$54.7	\$75.3	\$43.1	\$173.0
2024	\$61.8	\$82.5	\$47.2	\$191.5
2025	\$69.0	\$89.9	\$51.5	\$210.3
2026	\$76.4	\$97.3	\$55.7	\$229.4
2027	\$84.0	\$104.7	\$60.0	\$248.7
2028	\$91.8	\$112.3	\$64.3	\$268.4
2029	\$99.8	\$119.8	\$68.7	\$288.3
2030	\$108.0	\$127.5	\$73.1	\$308.6
2031	\$116.4	\$135.2	\$77.6	\$329.2
Cumulative Reduction	\$976.1	\$1,311.8	\$751.9	\$3,039.8

Summary

Table 14: Projected Risk Factor Prevalence						
Manitoba						
2012 Compared with 2031 (No Change) & 2031 (1% Reduction)						
	2012		2031 (No Change)		2031 (1% Reduction)	
	% Population with RF	# Individuals with RF	% Population with RF	# Individuals with RF	% Population with RF	# Individuals with RF
Males						
<i>Smokers</i>						
Light	6.6%	44,193	6.5%	49,541	5.4%	40,620
Moderate	6.1%	39,636	5.9%	44,613	4.8%	36,582
Heavy	5.3%	33,352	4.9%	36,938	4.0%	30,121
Subtotal - Male Smokers	17.9%	117,180	17.3%	131,093	14.2%	107,322
<i>Excess Weight</i>						
Overweight	37.5%	238,647	37.8%	285,988	34.2%	258,968
Obese	17.3%	109,116	17.3%	131,112	14.3%	107,953
Subtotal - Male Excess Weight	54.8%	347,763	55.1%	417,101	48.4%	366,922
<i>Inactive</i>	38.4%	243,631	39.1%	296,519	32.4%	245,559
Females						
<i>Smokers</i>						
Light	7.5%	48,635	7.3%	55,366	6.0%	45,413
Moderate	5.1%	33,254	5.0%	37,534	4.1%	30,779
Heavy	2.0%	14,129	2.1%	15,930	1.7%	13,042
Subtotal - Female Smokers	14.6%	96,018	14.4%	108,831	11.8%	89,233
<i>Excess Weight</i>						
Overweight	23.0%	147,236	24.2%	179,046	23.2%	171,160
Obesity	17.9%	110,393	17.8%	131,341	14.6%	108,018
Subtotal - Female Excess Weight	40.9%	257,630	42.0%	310,387	37.8%	279,178
<i>Inactive</i>	45.8%	296,115	47.6%	360,271	39.4%	298,174
Both Sexes						
<i>Smokers</i>						
Light	7.0%	92,828	6.9%	104,907	5.7%	86,033
Moderate	5.6%	72,890	5.4%	82,147	4.4%	67,360
Heavy	3.7%	47,481	3.5%	52,869	2.9%	43,162
Subtotal - Smokers	16.3%	213,198	15.8%	239,923	13.0%	196,556
<i>Excess Weight</i>						
Overweight	29.9%	385,883	31.1%	465,034	28.7%	430,128
Obesity	17.3%	219,510	17.5%	262,453	14.4%	215,972
Subtotal - Excess Weight	47.2%	605,392	48.6%	727,487	43.2%	646,099
<i>Inactive</i>	42.1%	539,746	43.4%	656,790	35.9%	543,734

Table 15: Projected Economic Burden of Smoking, Excess Weight and Physical Inactivity

Manitoba

2012 Compared with 2031 (No Change) & 2031 (1% Reduction)

2012 Constant Dollars

	2012			2031 (No Change)			2031 (1% Reduction)		
	Total Direct Cost of RF (M\$'s)	Total Indirect Cost of RF (M\$'s)	Total Cost of RF (M\$'s)	Total Direct Cost of RF (M\$'s)	Total Indirect Cost of RF (M\$'s)	Total Cost of RF (M\$'s)	Total Direct Cost of RF (M\$'s)	Total Indirect Cost of RF (M\$'s)	Total Cost of RF (M\$'s)
Males									
<i>Smokers</i>									
Light	\$38	\$79	\$117	\$43	\$88	\$131	\$37	\$77	\$114
Moderate	\$54	\$112	\$165	\$61	\$126	\$186	\$53	\$109	\$162
Heavy	\$64	\$131	\$195	\$71	\$145	\$215	\$61	\$125	\$186
Subtotal - Male Smokers	\$156	\$321	\$477	\$174	\$359	\$532	\$150	\$311	\$462
<i>Excess Weight</i>									
Overweight	\$37	\$110	\$147	\$45	\$132	\$176	\$40	\$119	\$160
Obese	\$62	\$149	\$211	\$74	\$179	\$254	\$61	\$148	\$209
Subtotal - Male Excess Weight	\$99	\$259	\$358	\$119	\$311	\$430	\$102	\$267	\$369
<i>Inactive</i>	\$48	\$104	\$152	\$59	\$127	\$186	\$49	\$105	\$154
Subtotal	\$303	\$684	\$987	\$352	\$796	\$1,148	\$301	\$683	\$984
Females									
<i>Smokers</i>									
Light	\$35	\$70	\$105	\$40	\$80	\$120	\$35	\$70	\$105
Moderate	\$41	\$82	\$122	\$46	\$92	\$138	\$40	\$80	\$120
Heavy	\$28	\$58	\$86	\$32	\$65	\$97	\$28	\$57	\$84
Subtotal - Female Smokers	\$104	\$209	\$314	\$118	\$237	\$355	\$103	\$207	\$309
<i>Excess Weight</i>									
Overweight	\$41	\$108	\$149	\$50	\$131	\$181	\$48	\$125	\$173
Obesity	\$98	\$213	\$311	\$116	\$254	\$370	\$96	\$209	\$304
Subtotal - Female Excess Weight	\$139	\$321	\$460	\$166	\$385	\$551	\$144	\$334	\$478
<i>Inactive</i>	\$64	\$154	\$218	\$77	\$188	\$265	\$64	\$155	\$219
Subtotal	\$307	\$685	\$992	\$362	\$809	\$1,171	\$310	\$696	\$1,006
Both Sexes									
<i>Smokers</i>									
Light	\$73	\$149	\$222	\$83	\$168	\$251	\$72	\$146	\$218
Moderate	\$95	\$193	\$288	\$107	\$218	\$324	\$93	\$189	\$282
Heavy	\$92	\$188	\$280	\$103	\$210	\$312	\$89	\$182	\$271
Subtotal - Smokers	\$260	\$530	\$790	\$292	\$596	\$887	\$253	\$518	\$771
<i>Excess Weight</i>									
Overweight	\$79	\$218	\$296	\$95	\$263	\$358	\$88	\$245	\$333
Obesity	\$160	\$363	\$522	\$191	\$433	\$624	\$157	\$356	\$513
Subtotal - Excess Weight	\$238	\$580	\$818	\$285	\$696	\$981	\$245	\$601	\$846
<i>Inactive</i>	\$112	\$258	\$370	\$136	\$314	\$451	\$113	\$260	\$373
Total	\$610	\$1,369	\$1,979	\$714	\$1,606	\$2,319	\$611	\$1,379	\$1,990

RF = Risk Factor

