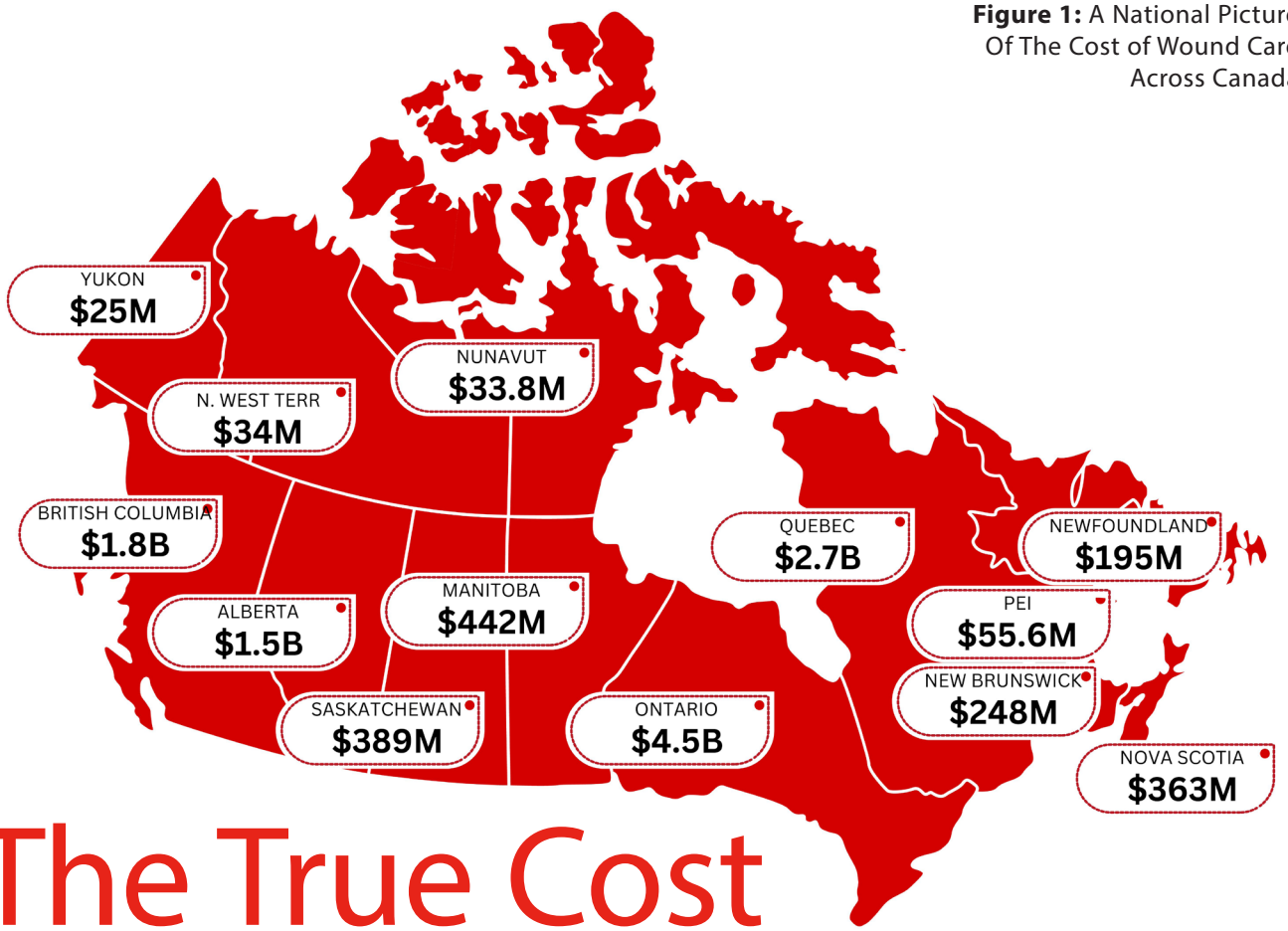

Figure 1: A National Picture Of The Cost of Wound Care Across Canada

The True Cost Of Wounds For Canadians

By Douglas Queen BSc PhD MBA and Mariam Botros DCh DE IIWCC MEd

How to cite: Queen D, Botros M. The true cost of wounds for Canadians. Wound Care Canada. 2024;22(1): 16-20. DOI: 10.56885/NXMW2913.

Introduction

For many wound care providers within Canada getting a handle on the costs associated with their management of chronic wounds is difficult, if not impossible. There are some published figures looking at costs geographically, both national and provincial/territorial, but most of these are not 'standardised', which doesn't permit comparison easily or directly. Many researchers and clinicians focussed on wound care have for years recognised this difficulty. They have also recognised the constant 'undervaluing' of the real

costs of managing patients with wounds.

One consistent theme from several international research studies, however, is that they relate the costs of wounds, extrapolated or otherwise, to the total geographic health-care costs of that region.[1-12] This provides a percentage figure as a benchmark, an approach which Canada has used previously.[13] While this is likely an underestimate, it is at least a starting point for most wound care providers.

A basic literature search shows the paucity of data generally across Canada, and in some provinces/territories, as well as the outdatedness of the data, with most of it being published over a decade ago. Due to the difficulties of capturing such cost data, most of these studies caution that their results may be an underestimate of the costs involved. In this situation, Canada is no different to the other nations.

A recent editorial in the *International Wound Journal* introduced an approach to estimate the possible costs of wound care using freely available governmental health data, population statistics and the research findings of many international groups.[14] Using these statistics and a simple formula provides an estimate of the likely costs of wound care within both Canada and the provinces and territories of which it is comprised. This will provide a more detailed vision of the likely cost of wounds for Canadians.

Methods

Governments, including both Canada's federal and provincial/territorial legislative bodies, capture annual population[15] and health-care costs.[16] These statistics are a valuable starting point for the estimation of the cost of wounds.

Many researchers have studied and estimated the costs of wounds in many locations around the world.[1-12] Such studies have demonstrated relative commonalities regarding wound care costs, ranging from 2-5% of total regional health-care costs upwards.[1-12] Understanding that research bias and GDP spending differences between geographies

Types Of Costs[22]

Direct Costs - those costs that are incurred by the health-care system and/or the patient as a direct result of the disease and its associated treatment.
Indirect Costs - less obvious and include the losses to society caused by the disease and its treatment.

Examples of Direct Costs	Examples of Indirect Costs
• diagnostic tests • costs of dressings, tape, cleansers, bandages, adjunctive therapies, medications and other materials • staff time costs • site of care overheads (e.g. administration, building costs, heating, lighting) • Transportation costs (e.g. ambulance)	• loss of income by patients and/or their carers due to reduced time at or ability to work • out of pocket expenses related to inability to undertake domestic responsibilities • welfare or disability payments by government or insurance company

When analysing cost studies look for the perspective or viewpoint of the analysis to understand the true value of any study.

In the case of this analysis the perspective is that of the health system, therefore only the costs incurred by the health system in the treatment of wounds was included, i.e. mainly direct costs.

Table 1: Formula To Estimate Wound Care Costs Geographically:

$$EWCE = [PCHCS \times TP] \times AWCCP$$
EWCE - Estimated Wound Care Expenditure (PPP International $) – our estimate of the likely wound care costs.
PCHCS - Per Capita Health Care Spend (PPP International $) [16] – current published per capita health-care cost.
TP - Total Population [15]
AWCCP – Average Wound Care Cost Percentage [14] – several published studies have indicated that the percentage of total health-care costs that is represented by the cost of wounds, ranges from 2% on the low end to 5% on the high end. For the purposes of our calculations, remembering different geographies can be at differing evolutionary stages regarding wound care, we chose the median of 3.5% as the AWCCP.

Table 2: Estimated Costs Of Wound Care Within Canada:

Province or Territory	Population (2023)[15]	Per Capita Health Spend 2023 (CAD$)[16]	Estimated Total Health-care Spend 2023 (CAD$)	Estimated Spend On Wounds 2023 (CAD$)
Yukon	45,148	$15,696	$708,643,008	$24,802,505
Prince Edward Island	175,853	$9,036	$1,589,007,708	$55,615,270
British Columbia	5,581,127	$9,182	$51,245,908,114	$1,793,606,784
Ontario	15,801,768	$8,245	$130,285,577,160	$4,559,995,201
Manitoba	1,465,440	$8,616	$12,626,231,040	$441,918,086
Nova Scotia	1,066,416	$9,737	$10,383,692,592	$363,429,241
Alberta	4,756,408	$9,041	$43,002,684,728	$1,505,093,965
Quebec	8,948,540	$8,785	$78,612,923,900	$2,751,452,337
New Brunswick	842,725	$8,413	$7,089,845,425	$248,144,590
Saskatchewan	1,218,976	$9,112	$11,107,309,312	$388,755,826
Nunavut	40,817	$23,652	$965,403,684	$33,789,129
Northwest Territories	44,760	$21,750	$973,530,000	$34,073,550
Newfoundland and Labrabor	540,418	$10,333	$5,584,139,194	$195,444,872
Canada	**40,528,396**	**$8,563**	**$347,044,654,948**	**$12,146,562,923**

may influence this figure,[14] the authors decided to take the median point of 3.5% as an international average. Similar to the other statistics used in their analysis, this will be revised annually. Or if a particular geography has a good handle on their own percentage, this can be modified in the formula to have a more local estimate.

Using the methodology of Queen & Harding,[14] the indicated formula (See Table 1) was used to estimate the costs of wounds both in Canada and within its provinces and territories.

Results

Table 2 provides a snapshot of the possible costs of wound care within Canada in the year 2023.

Discussion

From a previously published editorial in the *International Wound Journal*,[14] it was estimated that the costs of wound care in Canada in 2019, were 6.9 billion PPP International Dollars* (or 8.28 billion CAD -using the IMF Conversion Rate[17]). Recently, the authors of this manuscript published an editorial in the *International Wound Journal* that updated these figures to 2022.[18] This put the estimate for Canada at just over $11 billion, which was a significant increase. The three years between estimates were highly influenced by COVID which drove up per capita cost significantly during that period. This may or may not have artificially inflated the estimate for the cost of wounds. However, several studies showed that wound care was less than optimally delivered during this period and, as such, the costs of wound care would be higher.[20] It may, therefore, be a reflection of the true costs during the pandemic timeframe.[20]

In this article we have updated the figures to 2023, as new governmental figures for population and cost were available. Once again, these figures have risen as the population of Canada increases and, for the most part so does the cost of our individual health care. The 2023 estimate for Canada as a nation has now surpassed $12 billion. The data presented in Table 2 and Figure 1 provides a crucial estimate of the likely costs of wounds across Canada's provinces and territories. This comprehensive national perspective on wound costs significantly surpasses prior estimates from 2012.[13] It acts as a vital benchmark at both provincial/territorial and national levels, serving as a tool for evaluating the effectiveness of standardizing wound care, advancing education and training initiatives and measuring the return on investment for government-funded research and educational grants in this clinical field.[21]

Conclusions

Identifying realistic estimates of the cost of wounds enables health-care organizations to optimize resource allocation, facilitating the efficient allocation of budgets and personnel to address the unique needs of patients. Secondly, this understanding acts as a catalyst for elevating the quality of care provided to individuals with wounds. Organizations are incentivized to invest in training, acquire necessary technology and adopt best practices, all of which contribute to cost reduction while simultaneously enhancing patient outcomes.

Furthermore, comprehending the economic impact of wound care offers valuable insights to policymakers and health-care leaders, shedding light on the broader economic implications of wound management. This knowledge serves as a foundation for informed decision-making and the development of policies and research direction that support effective wound prevention and care practices.

Wounds Canada has committed to provide the regional updates regularly to keep researchers up to date with the most recent estimates based on updated government statistics and any research findings.

**An international dollar is defined as being able to buy in the cited country a comparable amount of goods and services a U.S. dollar would buy in the United States.[19]*

Douglas Queen BSc PhD MBA is CEO Medicalhelplines.com Inc, Toronto ON. **Mariam Botros DCh DE IIWCC Med** is Chief Executive Officer of Wounds Canada, a chiropodist and an educator.

References

1. Bottrich JG. Challenges in chronic wound care: the need for interdisciplinary collaboration. Available from: https://www.medtechviews.eu/articles/challenges-chronic-wound-care-need-interdisciplinary-collaboration/
2. Gillespie P, Carter L, McIntosh C, Gethin G. Estimating the health-care costs of wound care in Ireland. J Wound Care. 2019 Jun 2;28(6):324-330. DOI: 10.12968/jowc.2019.28.6.324
3. Gottrup F, Holstein P, Jørgensen B, Lohmann M, Karlsmar T. A new concept of a multidisciplinary wound healing center and a national expert function of wound healing. Arch Surg. 2001 Jul;136(7):765-72. DOI: 10.1001/archsurg.136.7.765
4. Graves N, Zheng H. Modelling the direct health care costs of chronic wounds in Australia. Wound Practice & Research: Journal of the Australian Wound Management Association. 2014: 20-33. Available from: https://journals.cambridgemedia.com.au/application/files/8716/0505/5984/2201_02.pdf
5. Guest JF, Ayoub N, McIlwraith T, Uchegbu I, Gerrish A, Weidlich D, et al. Health economic burden that different wound types impose on the UK's National Health Service. Int Wound J. 2017 Apr;14(2):322-330. DOI: 10.1111/iwj.12603
6. Hjort A, Gottrup F. Cost of wound treatment to increase significantly in Denmark over the next decade. J Wound Care. 2010 May;19(5):173-4, 176, 178, 180, 182, 184. DOI: 10.12968/jowc.2010.19.5.48046
7. Karl T, Gussmann A, Storck M. Chronische wunden--perspektiven der integrierten versorgung [Chronic wounds--perspective for integrated care]. Zentralbl Chir. 2007 Jun;132(3):232-5. DOI: 10.1055/s-2007-960751
8. Nussbaum SR, Carter MJ, Fife CE, DaVanzo J, Haught R, Nusgart M, et al. An economic evaluation of the impact, cost, and medicare policy implications of chronic nonhealing wounds. Value Health. 2018 Jan;21(1):27-32. DOI: 10.1016/j.jval.2017.07.007
9. Posnett J, Franks PJ. The costs of skin breakdown and ulceration in the UK. In: Pownett M, editor. Skin breakdown: the silent epidemic. Hull: Smith & Nephew Foundation; 2007.
10. Posnett J, Gottrup F, Lundgren H, Saal G. The resource impact of wounds on health-care providers in Europe. J Wound Care. 2009 Apr;18(4):154-161. DOI: 10.12968/jowc.2009.18.4.41607
11. Purwins S, Herberger K, Debus ES, Rustenbach SJ, Pelzer P, Rabe E, et al. Cost-of-illness of chronic leg ulcers in Germany. Int Wound J. 2010 Apr;7(2):97-102. DOI: 10.1111/j.1742-481X.2010.00660.x
12. Soldevilla Agreda JJ, Torra I Bou JE, Posnett J, Verdu Soriano J, San Miguel L, Mayan Santos M. The burden of pressure ulcers in Spain. Wounds. 2007 Jul;19(7):201-6.
13. Wound Care Alliance Canada. (2012). Prebudget Consultations. https://www.ourcommons.ca/Content/Committee/411/FINA/WebDoc/WD5709773/411_FINA_PBC2012_Briefs/WoundCareAllianceCanadaE.pdf
14. Queen D, Harding K. What's the true costs of wounds faced by different healthcare systems around the world? Int Wound J. 2023 Dec;20(10):3935-3938. DOI: 10.1111/iwj.14491
15. Statistics Canada. Population estimates, quarterly. 2024 Mar 27.
16. Canadian Institute for Health Information. How do the provinces and territories compare? 2024. Available from: https://www.cihi.ca/en/how-do-the-provinces-and-territories-compare
17. International Monetary Fund. Implied PPP Conversion Rate. 2023
18. Queen D, Botros M, Harding K. International opinion-the true cost of wounds for Canadians. Int Wound J. 2024 Jan;21(1):e14522. DOI: 10.1111/iwj.14522
19. Schneider P, Vogler S. Medicine price surveys, analyses and comparisons.
20. Rogers LC, Armstrong DG, Capotorto J, Fife CE, Garcia JR, Gelly H, et al. Wound center without walls: the new model of providing care during the COVID-19 pandemic. Wounds. 2020 Jul;32(7):178-185.
21. Botros M, Gail MW, Kuhnke J, Despatis M. Saving diabetic limbs in Canada: partnership between the Public Health Agency of Canada and the Canadian Association of Wound Care. Int Wound J. 2012 Jun;9(3):231-3. DOI: 10.1111/j.1742-481X.2012.00984.x
22. Wounds international. International consensus. Making the case for cost-effective wound management. 2013. Available from: https://woundsinternational.com/wp-content/uploads/sites/8/2023/02/b9560da-3c41a84313477c9c0e7d83729.pdf