

actually under-represents the true difference in access to medical care.

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#### Reference

1. Gagnon L. Stats Can: 14% of Canadians have no family doctor. *CMAJ* 2004;171(2):124.

*Competing interests:* Member, Rural Issues Committee of the British Columbia Medical Association.

DOI:10.1503/cmaj.1041293

#### [Mr. Hamel responds:]

In the 2003 Canadian Community Health Survey, released in June 2004 and summarized in *CMAJ*,<sup>1</sup> about 4.5% of Canadians residing in urban areas and 5.5% of those in rural areas reported not being able to find a regular medical doctor. Proportionally speaking, these numbers are very similar. However, in terms of population, the 4.5% in urban areas represented about 965 000 of the 1.2 million Canadians (12 years of age or older) who reported that they were unable to find a regular medical doctor.

In analyzing these results, definitions matter. Our analysis was based on the definition of rural areas used for the Canadian census. Thus, we did not differentiate between rural and remote areas, for which the picture might be different. Also, having a regular family doctor does not imply better access to care, and our analysis did not examine the relation between having a regular medical doctor and the process of accessing care. Although we looked at the profile of people with and without a regular medical doctor in terms of some health care services such as routine tests (e.g., blood pressure check, mammography) and use of emergency departments, the survey did not measure issues related to primary care access such as those described by Paul Mackey.

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#### Reference

1. Gagnon L. Stats Can: 14% of Canadians have no family doctor. *CMAJ* 2004;171(2):124.

DOI:10.1503/cmaj.1041703

## Not a middle-of-the-road position

I cannot understand how Dr. Ursus<sup>1</sup> can claim to have a “middle-of-the-road” position on abortion when he clearly supports abortion on demand. He may deeply regret the necessity of abortions; however, by performing these procedures or referring patients for them, he’s chosen against his smaller, defenceless patients. He is on that side of the road.

**Donald S. Stephens**  
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#### Reference

1. Query. *CMAJ* 2004;171(11):1420.

DOI:10.1503/cmaj.1041752

## Strains and toxins of *Clostridium*

Jacques Pépin and associates<sup>1</sup> have reported an epidemic of *Clostridium difficile*-associated diarrhea (CDAD) associated with an increased case-fatality rate. They hypothesize the presence of a more virulent strain.

The genus *Clostridium* consists of gram-positive, anaerobic, spore-forming rods and is notorious for causing human and animal diseases by producing various extracellular toxins. *C. difficile* exerts its effects through toxin A, an enterotoxin, and toxin B, a cytotoxin, which result in colitis and pseudomembranes.<sup>2</sup> The development of a more virulent circulating strain could occur, in part, through the acquisition of a novel gut-specific toxin, possibly from another clostridial species.

The manifestations of severe CDAD described by Pépin and associates<sup>1</sup> (i.e., megacolon, perforation, shock or rapid death) resemble those of another clostridial-related disease, enteritis

necroticans. This condition, also referred to as pigbel or Darmbrand (“fire belly”), is an often-fatal intestinal illness characterized by hemorrhagic, inflammatory or ischemic necrosis with pseudomembranes, although it preferentially involves the small bowel.<sup>3</sup> It is caused by the  $\beta$ -toxin of *Clostridium perfringens* type C. This toxin is encoded by a plasmid-borne gene, *cpb2*, and is potentially transferable to other clostridial species.<sup>4</sup> In certain developing countries (e.g., Papua New Guinea), enteritis necroticans has been controlled by immunization against  $\beta$ -toxin,<sup>5</sup> which underscores the importance of this protein in intestinal disease. In developed countries, the condition is limited to adults with chronic illnesses and malnutrition. Reduced gastric acidity is a known risk factor, possibly because the toxin is not destroyed under these conditions.<sup>3</sup> Interestingly, proton pump inhibitors and decreased gastric acidity may also be associated with an increased risk for severe CDAD in Quebec.<sup>6</sup>

Diagnostic tests for CDAD have been available for years and are based on detection of toxin B (cytotoxin assay) or toxins A and B (immunoassay). The current epidemic strongly favours consideration that increased virulence may be due to elaboration of another toxin not detected by standard tests. A search for such toxins might be worthwhile in accounting for the more severe CDAD seen in Quebec.

#### Donald C. Vinh

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#### References

1. Pépin J, Valiquette L, Alary ME, Villemure P, Pelletier A, Forget K, et al. *Clostridium difficile*-associated diarrhea in a region of Quebec from 1991 to 2003: a changing pattern of disease severity. *CMAJ* 2004;171(5):466-72.
2. Poutanen SM, Simor AE. *Clostridium difficile*-associated diarrhea in adults. *CMAJ* 2004;171(1):51-8.
3. Petrillo TM, Beck-Sague CM, Songer JG, Abramowsky C, Fortenberry JD, Meacham L, et al. Enteritis necroticans (pigbel) in a diabetic child. *N Engl J Med* 2000;342(17):1250-3.
4. Bueschel DM, Jost BH, Billington SJ, Trinh HT, Songer JG. Prevalence of *cpb2*, encoding beta2 toxin, in *Clostridium perfringens* field isolates: correlation of genotype with phenotype. *Vet Microbiol* 2003;94:121-9.
5. Lawrence GW, Lehmann D, Anian G, Coakley CA, Saleu G, Barker MJ, et al. Impact of active immunisation against enteritis necroticans in Papua New Guinea. *Lancet* 1990;336:1165-7.
6. Louie TJ, Meddings J. *Clostridium difficile* infection in hospitals: risk factors and responses [editorial]. *CMAJ* 2004;171(1):45-6.

DOI:10.1503/cmaj.1041642

#### [One of the authors responds:]

Don Vinh's hypothesis is interesting. However, the toxins of *Clostridium perfringens* essentially result in severe necrotizing enteritis, sparing the large bowel, in contrast to the hypervirulent *C. difficile*, which causes severe colitis,<sup>1</sup> with little involvement of the small bowel. Nevertheless, the mechanism postulated deserves further investigation.

#### Jacques Pépin

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#### Reference

1. Pépin J, Valiquette L, Alary ME, Villemure P, Pelletier A, Forget K, et al. *Clostridium difficile*-associated diarrhea in a region of Quebec from 1991 to 2003: a changing pattern of disease severity. *CMAJ* 2004;171(5):466-72.

DOI:10.1503/cmaj.1041735