Manitoba use animals. In Halifax, Nova Scotia and all of British Columiba, simulators are used. In Edmonton, Alberta, both options are offered.

"I'm really surprised that anyone anywhere running the program would require someone to use animals and not provide an alternative method," says Pippin.

Indeed, replacement is one of the "3 Rs" that guide the policies of the Canadian Council on Animal Care, the organization that oversees the use of animals in research, testing and teaching in Canada. The other Rs are reduction (using fewer animals) and refinement (causing less distress to animals).

"By and large, if there were acceptable and appropriate alternatives, I think people would run to get them," says Michael Baar, the council's assessment program coordinator. "You're talking about an initial investment compared to having to purchase and look after animals, and all the things that go with that."

In 2006, the latest year for which the Canadian Council on Animal Care has statistics, 2 535 989 animals were used for scientific purposes in Canada, the vast majority in studies. Only 4% were used for education. The number next to the category "swine" is 37 942, but no breakdown is provided as to how the pigs were used.

Until swine are no longer used in trauma courses in Ontario, some doctors will continue to see their job opportunities constrained.

Dr. Sonia Malhotra, a 29-year-old who recently completed a residency in family medicine at the University of Toronto, needs to complete the course to obtain a rural placement. She's put it off, though, because of the animal lab. Now she's considering flying to British Columbia to do the course. "I think it's worth the price to use 1 less life."

Dr. Tushar Mehta, who practises emergency and family medicine in southern Ontario, recently attended the course but didn't receive a certificate because he refused to do the surgical component. Without the certificate, he is ineligible to work in many emergency departments.

Mehta, 37, is a follower of Jainism, an ancient religion of India that stresses reverence for all forms of life. Though he believes training on animals is acceptable in some cases, he feels he shouldn't be forced to violate his ethical principles if a valid nonanimal model exists.

"If I can't do it because of my beliefs, I have no business being in practise," he says. "I shouldn't enter the profession if I can't do what's required of me, but I put medicine first. But for family and emergency medicine, there isn't really a need to practise on animals."

Courtesy of Dr. Tushar Mehta

Dr. Tushar Mehta, a believer of the ancient religion of Jainism, which holds that all forms of life are sacred, says there's no need for emergency room physicians to practise on animals.

Many other doctors agree, claiming the training needs of surgeons are very different than those of doctors brushing up on trauma protocol. Laparoscopic techniques, suturing, stapling, organ removal and many other skills that surgical residents must master cannot be adequately learned on simulators. But trauma courses are primarily designed to teach emergency management, not to create crackerjack surgeons. It is more about teaching a mindset than a skill set, and that's why even many surgeons advocate simulators for trauma training.

"It's not at the level of having real tissue and having a real beating heart," says Dr. Ross Brown, a surgeon and the director of British Columbia's Advanced Trauma and Life Support program.

"But given that these are trained doctors, and given that this is really teaching them algorithms and protocols, what in that hour-and-a-half are you going to get out of it? And is it going to make a big difference if it's an animal or if it's another model?"

Some trauma program coordinators have realized that moving to simulators will save them the expense of maintaining an animal supply and the fuss of dealing with animal activists.

Still, some doctors warn that medical educators must tread lightly when changing the way they teach important skills. There is always the risk that adopting a new educational model — whether for economic reasons, political reasons or any other reason — could come at the expense of patients.

"I get nervous when I hear physicians or surgeons or anybody saying 'ideally, this is the way, but this is good enough,'" says Dr. James Bond, a clinical instructor and the head of thoracic surgery at Surrey Memorial Hospital, in Surrey, British Columbia. "If I'm the patient, I want it to be 'this is the ideal,' not 'this is good enough.'" — Roger Collier, *CMAJ*

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Close the gap in health, international report urges

No biological reason exists for the dramatic differences in health and life expectancy of people around the world, says the chair of the World Health Organization's Commission on Social Determinants of Health.

Instead, a toxic combination of poor social policies, unfair economic arrangements and bad politics can be blamed for most of the health inequities, says Sir Michael Marmot.

And around the world these inequities influence all classes. "There is a finely graded relation between people's social and economic circumstances and their health," the epidemiologist told a press conference. "People in the middle have worse health than people at the top, but better health than those at the bottom."

Worldwide, health inequities mean the risk of dying during pregnancy and childbirth is 1 in 17 400 in Sweden but 1 in 8 in Afghanistan, and that a child born in one Glasgow, Scotland, suburb can expect to die 28 years sooner than another born just 13 kilometres away.

The Commission's report, *Closing the gap in a generation, health equity through action on the social determinants of health*, released Aug. 28, 2008, is the culmination of 3 years of work by 19 commissioners, including Professor Monique Bégin, Canada's former federal health minister.

Key to the "closing the gap" goal is addressing the gender inequities that exist in all societies and improving the lives of girls and women, the report maintains. Access to education and sexual and reproductive health programs must be improved and legislation must make illegal discrimination on the basis of gender. Worldwide, average infant mortality rates are far higher for women with little education compared to those with secondary or higher education.

The report also takes aim at certain tax, trade and foreign aid policies; warns that globalization has beneficial but also disastrous impacts on health; and decries the commercialization of social goods such as education and health care. It notes:

- Nordic countries have rates of poverty similar to Canada's before taxes and transfers are taken into account, but substantially lower rates after taxes and transfers.
- Gross national product per capita more than doubled in donor countries from 1961 to 2002, while foreign aid per capita increased by less than 10% (to $67 per capita from $61).
- Water tariffs increased by 200% when an international consortium was awarded a 40-year concession for the water and sanitation system in the third largest city in Bolivia.
- When health care user fees were abolished in Uganda in 2001, national immunization rates more than doubled to 84%.

The marked failure of markets to supply vital goods and services equitably underscores the need for strong public sector leadership and adequate public expenditures, the report states.

Hence it supports a strong public sector that provides goods and services such as clean water and health care universally, regardless of the ability to pay. But Marmot says he was surprised by evidence of how much can be achieved by grassroots activism, as commission research illustrated that many governments act only after communities have led the way. Society has traditionally looked to the health sector to address health and disease concerns but most ministries of health pay no attention to understanding the sources of good health, arguing that it's not their business, (see sidebar), Marmot says.

Health ministries, Marmot adds, must become advocates within government to reduce health gaps in populations and argue for "health in all policies." — Ann Silversides, *CMAJ*

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Political dogma a major barrier to action on social determinants of health

"Ideological barriers" at the federal level will likely prevent the government from acting on key recommendations of the World Health Organization's report on the social determinants of health, although it could spark action in other parts of the world, says a distinguished Canadian physician.

The concept of equity from the start of life — which lies at the core of the Closing the Gap report — is clever, but "we don't have it here," says Dr. Fraser Mustard, founder and former president of the Canadian Institute for Advanced Research, head of the Founders Network and a long-time advocate for early child development programs.

Prime Minister Stephen Harper "doesn't believe in it," Mustard says.

The WHO report calls for a comprehensive approach to child development that facilitates early cognitive, social and emotional development.

But "ideologues believe that families should have full responsibility," says Mustard, who promotes the creation of voluntary, community-based early child development programs.

One of the Harper government's first acts was to cancel the national child care and early learning program, negotiated largely by then-Liberal minister of social development Ken Dryden.

Mustard says that while the WHO report explains that early development affects learning throughout life, a shortcoming is that it doesn't emphatically make the case that failure to provide appropriate care and stimulus in the early years leads to a greater health burden later.

"Investment in early childhood is where all the dividends will come from," agrees James Dunn, a research scientist at St. Michael's Hospital and Canadian Institutes for Health Research/Public Health Agency of Canada chair in applied public health.

Reuters / Romeo Ranoco

A homeless mother bathes her daughter using waste water from a building in Makati, Metro Manila, Philippines.