A Canada-Brazil Network in the Global Eradication of Smallpox

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The year 2010 marks the 30th anniversary of the global eradication of smallpox, the only public health effort in history to eradicate a disease from the human species. The Smallpox Eradication Program (SEP) of the World Health Organization (WHO) was an assemblage of state, bilateral and multilateral agencies and resources, deftly brought together and coordinated by Donald A. Henderson, SEP director from 1966 to 1977. Less visible but equally crucial to the success of the SEP, especially at the level of vaccine research and production, were informal networks of public health scientists.

These "epistemic communities" were made up of knowledge-based experts with authoritative claim to policy-relevant knowledge within their field of expertise.[1] Circulating among and transecting different levels of international cooperation, their members shared similar academic backgrounds and scientific values, frequented the same seminars and specialist committee meetings, and understood the challenges involved in the production of vaccines. Often rooted in well-established research and production facilities, these networks could operate without official nation-state sanction or involvement by working through organizations with authority in international health like WHO and the Pan-American Health Organization (PAHO).

One such epistemic community linked Canada's Connaught Laboratories to the SEP and to Latin American – and particularly Brazilian – vaccine production. Its principal members were Henderson, José Fonseca da Cunha (1914-2005), who was responsible for vaccine and serum production at Brazil's Oswaldo Cruz Institute, and Connaught scientists Robert J. Wilson (1915-1989) and Paul Fenje. Officially, Canada played only an indirect part in the SEP through its role as a WHO member state, and at the outset of the global eradication initiative had no bilateral ventures of any kind in Latin America. The Canada-Brazil network linking Henderson, Wilson, Fenje, Fonseca da Cunha and others, however, allowed Connaught and Canadian scientists to become significant players in the global eradication effort[2] while simultaneously pressing the Canadian government to be less of a "reluctant partner" in health cooperation in the hemisphere.[3]

The SEP Link with Connaught

In 1965, the World Health Assembly voted to move ahead with a global smallpox eradication program, an idea first proposed by the Soviet delegation in 1958. Donald Henderson, an epidemiologist from the United States Centers for Disease Control (CDC) was appointed to direct the operation.[4] Descended on both sides from southwestern Ontario farmers, Henderson had strong Canadian medical roots. His mother, Eleanor McMillan, was a graduate of Chatham Hospital School of Nursing and worked on the smallpox wards at Henry Ford Hospital during North America's last outbreak of *variola major* in Detroit and Windsor in 1924; his uncle, William McMillan, a physician, would become the ranking Liberal Member of Parliament in the 1960s. Born in 1926 and raised in the United States, Henderson's 1946 attempt to follow family tradition and study Medicine at Queen's University was thwarted by admissions policies favouring returning veterans. Instead he took his MD at the University of Rochester before joining CDC.[5]

Hopes for disease eradication had waned following setbacks in the malaria eradication program launched in the 1950s and this was reflected in the SEP's meagre budget. Henderson created a network of allies who could provide resources outside WHO institutional structures. The strategy led him to Robert Wilson, then the second-in-command at Connaught Laboratories. A professor of Hygiene and Preventive Medicine at the University of Toronto and a senior researcher at Connaught prior to becoming Assistant Director in 1957, Wilson's research interests had been concentrated on the development and production of combined vaccines such as DPT and DPT-Polio.[6] Henderson had become good friends with Wilson from his days at CDC when both were closely involved with the introduction of the oral polio vaccine and attended many of the same meetings.[7] Henderson asked Wilson if Connaught could test batches of vaccine produced by laboratories in Latin America, and carry out site visits and oversee training to ensure that vaccines produced in the region met an SEP standard. This would allow local production to cover demand in populous areas like Brazil and let the SEP use donated vaccine in key sites like Indonesia that were without a domestic vaccine production capability.

In 1966, Connaught was an autonomous, non-profit laboratory affiliated with the University of Toronto and regularly working with the provincial and federal departments of health to develop a variety of vaccines. A world leader in the development of freeze-dried smallpox vaccine, unencumbered by corporate or governmental oversight but interested in possible export markets, Connaught was ideally suited to take on the role that Henderson had in mind.[8] Wilson, a well-connected public health scientist in a directorial post, was in a good position to accept Henderson's appeal. His decision to do so should also be understood in terms of its domestic backdrop. Canada was gearing up for its Centennial Year celebrations, and though the government remained ambivalent about playing any foreign policy or development role in the Americas, there was a new internationalism brimming in the country's professional elites, one fostered by Lester Pearson's profile and vision.[9] In more immediate public health terms, Latin America and Canada had been linked by smallpox only four years earlier, in 1962, when a Canadian boy had provoked a bad "smallpox scare" and emergency response after returning to Toronto via New York City suffering from smallpox contracted in Brazil.[10]

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Brazil and Smallpox

Brazil was one of the most significant countries in the global smallpox eradication program, and it was the key country in South America. Aside from its great size and the fact that it bordered on every state in the region, in the middle of the 1960s it was the only country with endemic smallpox, for the most part variola minor. Brazil had a long history of combating smallpox dating from the 19th century, though the disease had dropped off the public health agenda by the 1930s. Smallpox programs were revived by the Kubitschek administration in 1958 due to the international attention given to the Soviet eradication proposal to the World Health Assembly. A military government took power in Brazil in 1964, and began looking for national and international legitimacy. Despite formidable limitations in national infrastructure and fiscal capacity, and with most available epidemiological resources invested in malaria eradication, in November 1966 the regime began a Smallpox Eradication Campaign (CEV) associated with the WHO project. Even though some material resources and technical assistance came from abroad, the eradication of smallpox in Brazil was led and attained principally through national, Brazilian financial and human resources.[11] Vaccine science and production was concentrated at Oswaldo Cruz, a laboratory with a long history of serological and tropical medical research excellence.[12]

The vaccine science network linking Canada to Brazil actually pre-dated the creation of the SEP and the Brazilian CEV. Sponsored by a Rockefeller fellowship, Fonseca da Cunha had visited Connaught Laboratories in 1959, the same year that he became chief of vaccine production at Oswaldo Cruz.[13] As early as 1960, he initiated correspondence with Cleve Russell Amies, the scientist leading the research on freeze-dried vaccine at Connaught.[14] Fonseca da Cunha felt that a freeze-dried vaccine, whose development was subsequently undertaken at Oswaldo Cruz, was "the true solution to the Smallpox problem in Brazil … [which was a] big country."[15] He still held the conviction seven years later when stepped-up assistance from Connaught in the stabilization and quality control of freeze-dried vaccine would prove crucial to overcoming challenges stemming from the extension of the country's territory and population.

The Canada-Brazil SEP Collaboration

Mobilizing Connaught's resources, Wilson was joined by Yugoslavian-born Paul Fenje, internationally recognized for his improvement of smallpox vaccine quality.[16] Between their first trip in 1967 and the certification of smallpox eradication in Brazil in 1973, Connaught consultants made nine trips to Latin American countries, with an increasing concentration on Brazil where 62% of their 310 total person-days were spent.[17] Between 1967 and 1969 in particular Wilson and Fenje were applied-scientist road warriors of the late Pan-American age, taking on grueling itineraries with significant international health responsibility and the risk of professional and political embarrassment should something go wrong.[18]

The Connaught collaboration was considered a success by all three parties in the network.[19] Although Wilson and Fenje's efforts in Brazil were concentrated on stabilizing freeze-dried production methods at Oswaldo Cruz – by far the most important producer in South America – over half of their time in the country was spent on technical and training upgrades at serological laboratories in Sao Paolo and Porto Alegre.[20] Wilson felt that the link these 'secondary' labs (working somewhat in the shadow of the Oswaldo Cruz Institute) made with Connaught gave them tremendous technical, technological and morale boosts. In a 1970 letter to Henderson, he commented that he was "vastly pleased" to see that "both Institutes have taken the challenge, as have the young scientists and nothing is going to hold them back now."[21] Fonseca da Cunha recalled the relationship between Oswaldo Cruz and Connaught as a smoothly functioning one. "We sent vaccine samples to Toronto, they tested them and determined, 'This one's good, this one's no good'. And from time to time we welcomed the consultants to the laboratory."[22]

A number of Brazilian scientists from all three facilities trained at Connaught. Among them was Fonseca da Cunha, whose 1968 residency to study production and testing of sterile freeze-dried vaccine cemented strong personal and professional relations with Wilson and Fenje.[23] Between 1969 and 1972, crucial years for Brazil's CEV, Fonseca da Cunha served as cabinet secretary at the Ministry of Health. Wilson himself took over as Chairman and Director of Connaught in 1972, allowing him to lobby the Canadian government to make additional donations of vaccine earmarked for the global eradication program. In August 1973, he served as a member and Vice-Chairman of the commission that certified the eradication of smallpox in Brazil, and, consequently – Brazil being the last Latin American country with endemic cases – from the entire "America Region".[24]

Conclusion

Wilson's decision to make a deep commitment of Connaught's energies to WHO, PAHO and the Brazilian CEV is a good example of the willingness among leaders of the Canadian public health community to anticipate and promote the reorientation of Canadian foreign assistance, officially codified in a 1970 report initiated by the Trudeau government that embraced greater hemispheric involvement.[25] In a fraught political and ideological Cold War context, Brazilian public health laboratories were able to engage a 'neutral' network for additional technical assistance in carrying out a national eradication campaign, in so doing dove-tailing with the objectives of WHO's global eradication initiative. The history of this Canada-Brazil network reveals the importance of epistemic communities and non-governmental forms of engagement in the global eradication of smallpox, and in Canada-Brazil scientific collaboration.

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RÉSUMÉ

Objectifs : Déterminer si une forte augmentation des visites à la salle d'urgence de l'Hôpital de Montréal pour Enfants (HME) au cours de la semaine suivant le décès de Natasha Richardson, morte d'une blessure à la tête suite à une chute en ski, était a) statistiquement significative et b) liée à la couverture médiatique de l'événement. Nous avons postulé que la couverture serait moindre dans les médias francophones ainsi que dans les centres à l'ouest du Québec.

Méthode : Nous avons comparé le nombre de visites à l'urgence de l'HME pendant 10 semaines à compter du 5 mars et enregistré le nombre de blessures à la tête. Ces données ont également été comparées avec les moyennes du HME pour les mêmes semaines au cours des 16 années précédentes, avec le nombre de visites à l'Hôpital Sainte-Justine (HSJ), et avec celles de 3 autres hôpitaux pédiatriques de provinces à l'ouest du Québec pour la même période.

Résultats : Nous avons constaté une augmentation de 60 % des visites pour blessure à l'urgence de l'HME par rapport à la semaine de référence ($p<0,001$) et une différence de 66 % par rapport à la moyenne des 16 années précédentes. L'HSJ a également enregistré une forte hausse durant la même semaine, mais l'augmentation ne dura que quelques jours. Des augmentations moins importantes ont été observées dans les 3 autres hôpitaux pédiatriques. À l'HME, près de la moitié des visites ont été pour des blessures à la tête sans qu'il n'y ait aucun changement dans le nombre de celles jugées sévères.

Conclusions : Ces données suggèrent que la couverture médiatique de la mort de cette célébrité a suscité de l'inquiétude chez les parents, les incitant à venir à l'urgence avec leurs enfants et qui, autrement, n'auraient pas cherché à consulter pour des soins médicaux.

Mots clés : personnes célèbres; mass-médias; blessures/[Épidémiologie]; service urgences/statistiques et données numériques

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