

To find  
the  
smallpox  
program

**Charles Merieux medal –April 14, 2015**

**It is a great honor to be awarded the Merieux medal and to be counted among the notable list of awardees of the past 10 years. I came to know Charles Merieux during occasional meetings at the beautiful Merieux conference center in Talloires. He was a very approachable and genial man. His focus was always on the challenges of the infectious diseases in the developing world and on vaccinology.**

**As you may recall, it was on May 8, 1980 that the World Health Assembly announced that it was satisfied that smallpox had been eradicated and that vaccination could be stopped everywhere. It was an achievement to be celebrated-- especially by a remarkably creative field staff who had weathered unbelievable adversity – in all, some 850 international staff who served in the field for varying periods of time ranging from 3 months to 11 years -- and national staff who sometimes numbered more than 200,000 . A 10 year goal had been established – it was missed---but by little more than 9 months.**

**I am not infrequently asked as to what was the legacy of the program – "what did the program leave in terms of an ongoing structure and program of activities"?**

**It is important, first, to point out that the national smallpox programs were among the first health programs whose goals required involvement of the entire population. This necessarily included vaccination and surveillance activities among peoples living in dense slums and desolate areas who had never seen a health worker. The program served uniquely to demonstrate that health programs could involve the whole of a country.**

It offered a number of lessons and the impetus to undertake what is now unquestionably the most cost-effective health intervention in our public health armamentarium –immunization. I note but a few of the lessons learned:

1) Bureaucracies, however rigid, are never impassable barriers that cannot be surmounted. Demonstrations of this were frequent and necessary.

2) In most non-industrialized countries, supervised and monitored mobile teams are far more efficient than hospitals and primary health care centers in providing vaccination and distributing such as Vitamin A and malaria bed nets and in responding to unexpected emergencies. Primary health centers are essential for therapeutic services but seldom function well for public health programs.

3) Independent monitoring of vaccines (and drugs) to assure that they meet standards is critical. International monitoring of all smallpox vaccine by independent international laboratories revealed that when the program began, 90% of the vaccine available was substandard; some contained no detectable virus.

4) Regular weekly reports from health centers and hospitals throughout the country are critical for monitoring progress, detecting epidemiological patterns of the disease and for shaping strategy. The virtual absence of such activities has contributed significantly to the chaos and resilience of the Ebola epidemic.

### **The Birth of a Program**

By the third year of the smallpox program, it became apparent that with leadership and planning, mobile teams of vaccinators in Africa could average 500 vaccinations per person per day. If so much could be achieved with community-wide smallpox vaccination,

why not endeavor to expand the program to include other vaccines as well? Dr. Charles Cockburn, then head of the WHO Virus Diseases Division and I were contemplating prospects for funding an international conference to explore possibilities when we encountered an interested Maurice Hilleman and Merck. They expressed interest in funding such a conference.

Thus, in December 1970, WHO convened a four day " International Conference on the Application of Vaccines against Viral, Rickettsia, and Bacterial Diseases of Man". Two committees were constituted to meet during the course of the conference. One was to consider the design of immunization programs for developed countries"; the second, "to develop designs for the developing countries". Cockburn served as secretary for the first and I for the second.

Our developing countries' committee expressed their concerns about vaccination programs that required visits to health centers and advised that the possibility of mobile teams be seriously weighed. Vaccines that were recommended at that time were smallpox, BCG, DPT, measles, and, in some countries, polio and yellow fever vaccines. The Proceedings of the Conference were published and number some 650 pages in length.

Thus, the groundwork was laid for an Expanded Program on Immunization. This was approved by the World Health Assembly in 1974—3 years later. UNICEF gave this initiative high priority and Rotary International offered to buy oral polio vaccine. In 2000, GAVI, the Global Vaccine Initiative, was created and that, in turn, brought in other UN Agencies, public health institutes, foundations, and others .

Only a year after EPI was created, PAHO recruited Dr. Ciro de Quadros to direct its EPI program and steadily it gained momentum. Polio in the Western Hemisphere was eliminated in 1991, measles in 2002, and rubella in 2010. Other vaccines have been added including Hep B, Hib, rotovirus, and rubella. Progress is being made in other parts of the world although much remains to be done before a number will be able to meet the standards of PAHO. In 1974, prior to the EPI, child vaccination coverage globally was estimated by UNICEF to be less than 5% for DPT, polio, measles and other vaccines. Today, it exceeds 80%.

Such is a segment of the legacy of smallpox eradication.