

Opening Presentation – Rio Conference August 14, 2010

- President Godelha, Joel, Ciro, Dr. Rosas
- Many distinguished guests, friends, and colleagues
- I am delighted to be here today with so many from so many parts of the world to share

in the celebration of an historic achievement and to look hopefully to the future. Many of you I haven't seen since the end of the smallpox campaign. Thus, the opportunity to renew friendships is a welcome bonus to what promises to be a fascinating symposium.

- Many were unable to come and we shall miss them. In, particular Nicole Grasset and our Brazilian colleague, Herman Schatzmeyer, who contributed so much to the program. They died earlier this year. Two key people who very much wanted to be here but could not, asked that I personally extend their greetings – Dr. Isao Arita and Jock Copland, dedicated key staff in Geneva. Both were with the program from its beginning through the occurrence of the last case and are well known to most of you.

- The venue --the historic Oswald Cruz Institution is ideal. If my history is correct, it was from this site a bit more than a century ago that Oswaldo Cruz himself undertook to introduce compulsory smallpox vaccination throughout Brazil. I would like to join Joel and Ciro in expressing personal appreciation to President Godelha and his colleagues for hosting this symposium. And personal thanks to the many who have worked so long and diligently in conceptualizing a remarkable program and in recruiting an outstanding group of speakers from around the world – many of them veterans of the program

My role this evening is to provide a brief overview of key events in smallpox eradication which bring us together at this time. And, for those whose knowledge of smallpox

and the program is little more than a name, some orientation to provide context for the papers and discussions scheduled over the next three days.

Thirty years ago a special WHO Global Commission met and reviewed reports of smallpox and smallpox programs from around the world. At the conclusion of their meetings, they reported to the World Health Assembly that they were confident that no smallpox cases had occurred anywhere in the world for more than two years. The Assembly unanimously approved the report and recommendations and declared that smallpox had been eradicated – that vaccination everywhere could cease. Never before nor since has a disease been eradicated. Mankind was at last freed of a disease that had killed and maimed since the dawn of written history – more feared than any of the great pestilences – be it plague or yellow fever or cholera or malaria. The earliest records of smallpox go back more than 3000 years ago -- four Egyptian mummies whose bodies show the characteristic pustules of smallpox. Since that time, smallpox has spread from person to person, from county to country, in every climate and in every season of the year. In many traditional cultures -- from Japan and China to India and West Africa -- smallpox gods and goddesses were worshiped. It is the only disease that played such an important role in the lives of citizens that special deities and temples were created. Even during the 20th century, an estimated 300 million died of smallpox — more than twice the death toll of all the century's military wars combined.

The program itself was unique. It required the cooperation of all countries throughout the world and the active participation of more than 50 --each with its own bureaucracy, I might add. It was more far-reaching than any previous effort that mankind had ever undertaken. Of note is that two of the principal supporters were the Soviet Union and the United States – and this during the height of Cold War tensions. Eradication was a unique challenge for the World

Health Organization to demonstrate its capacity and importance as a pioneering leader in global health.

The program changed the lives and careers of many of the national and international staff who participated. I was one of those. The experience was transforming -- to witness how much could be achieved in prevention, how inexpensively, and how rapidly. Basically, for smallpox, it required the addition of a comparatively small number of health staff, supplies of a protective vaccine -- a simple but effective strategy of mass vaccination -- and the establishment of a surveillance system that could achieve the early discovery and control of outbreaks. The eradication effort in 20 West African countries was among the earliest successes. That area was the world's most highly infected; the nations involved had the least resources of any. Surprisingly, the last case was registered only three years and five months after the program began. It was a dramatic demonstration of the effectiveness of a new strategy which included surveillance and containment. More than 100 million people were smallpox free as a result of the work of national staff with technical assistance provided by just 50 CDC public health advisers. The achievement provided courage to health authorities everywhere to pursue the ambitious goal of eliminating the disease in just 10 years. But countless, all but insuperable obstacles regularly threatened success -- civil wars, floods, famines, hordes of refugees, periodic shortages of vaccine and funds, impenetrable bureaucracies, red tape, kidnappings, and fatigue. The eradication goal of 10 years was missed -- but by only 9 months and 26 days. During the global program, many field staff, stimulated by the experience, dedicated their lives to public health. Their subsequent career achievements both nationally and internationally have been extraordinary. A number have traveled from sites around the world to be here with us for this meeting.

The smallpox eradication program was the original stimulus for another critical initiative which has resulted in dramatic changes in global health—the Expanded Program of Immunization. The concept of this program arose logically from observations during the first four years of the smallpox campaign. It was discovered during the early years in Africa, that, with good planning and community cooperation, a team of four persons with a vehicle could vaccinate 2000 or more persons per day. That can be translated into just one team being able to reach more than 400,000 people in a year. Notably, when smallpox eradication began (1967), there were no other national programs for vaccination in the developing world. Diphtheria, whooping cough, tetanus, polio, and measles were uncontrolled but for all of them vaccines were available and used by most industrialized countries. Why not give other vaccines? In 1970, an international meeting was convened by WHO and a decision was reached by participants to recommend that the smallpox program be expanded to include preventive vaccination for all of these diseases—DPT, polio, and measles. This was approved by the World Health Assembly in 1974 and so began the EPI program. With major support from UNICEF and Rotary International, it substantially reached its target by 1990 of establishing systems to vaccinate 80% of all children. And so began an era which we celebrate here as well, an era during which vaccines have proliferated in number with increasing efforts being made to reach all citizens however remote their residence and however impoverished. Polio is nearing eradication and, here in the Americas both measles and rubella have met their end. These will be discussed during this symposium along with the remarkable Guinea Worm eradication effort whose director and guiding light was a smallpox veteran.

It is especially fitting that this symposium takes place in Brazil because the country and Brazilian experts have played a special role both in the eradication of smallpox and polio and

in the EPI. I would remind you all that smallpox eradication came into being during the 20 years that the eminent Brazilian public health physician, Dr. Marcelino Candau, was Director General of the World Health Organization. And polio eradication in the Americas was achieved during the years another public health expert, Dr. Carlyle Macedo was director of the Pan American Health Organization.

Other notable Brazilian landmark achievements include the 1965 field trials of the new jet injectors. These were conducted here by joint teams of CDC and Brazilian investigators. The injectors were to become the principal vaccination instruments throughout Latin America and West Africa. National smallpox eradication began in Brazil in 1966 and the following year the world's first national smallpox surveillance reports began to be published, *The Boletim Semenal*. That publication, now 47 years later is Brazil's weekly report on infectious diseases. In 1973, Brazil with the Americas was the first region to be certified as having eradicated smallpox.

However, one of the most notable of Brazil's achievements, to my mind, was a unique event that few believed could be successfully executed and repeated year after year— National Immunization Day. The goal was, on a single day, to vaccinate against polio all children under 5 years of age. Many sites for vaccination were established; media coverage was extensive; and the response of the population was remarkable. Not only did Brazil vaccinate 90% of the target number, it repeated this twice annually with similar results each time. Polio incidence plummeted; other countries began to imitate this and other aspects of the Brazilian program. In 1985, the director of PAHO's Expanded Program on Immunization proposed an eradication campaign to rid the Americas of polio. The director was, of course, Brazil's own Dr. Ciro de Quadros, a veteran WHO smallpox epidemiologist. Little more than 5 years later,

the last case of polio occurred in the Western Hemisphere. The plans and strategy used in the Americas was copied by WHO for a global program which began soon afterwards.

But as a prelude to the symposium, let me remind you visually but briefly about clinical smallpox and provide you a capsular view of the program.

Smallpox and its Eradication

Introduction to an ancient disease and an historic program

D.A.Henderson
Director of the WHO eradication program,
1966-77

Rio de Janeiro, August 24, 2010

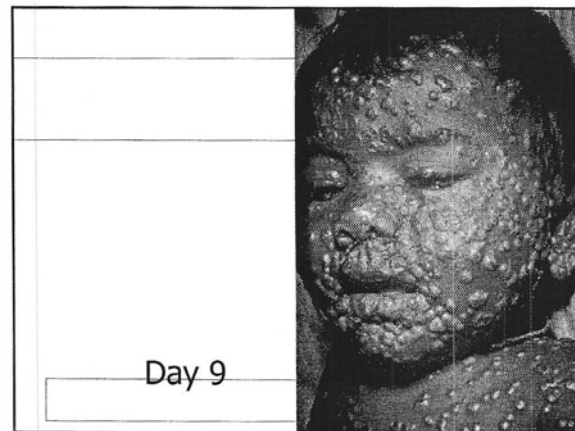
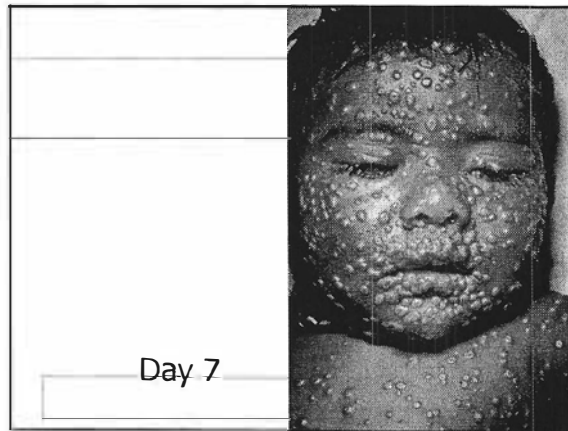
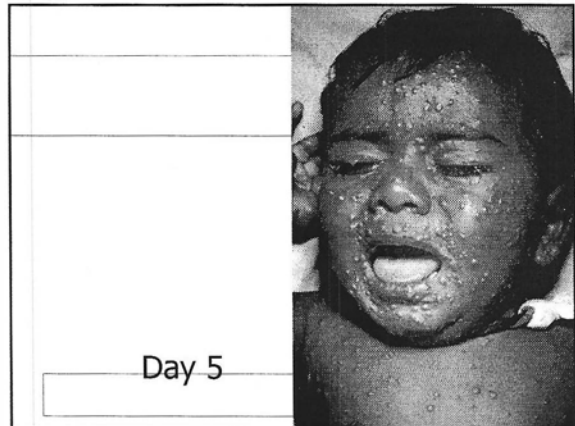
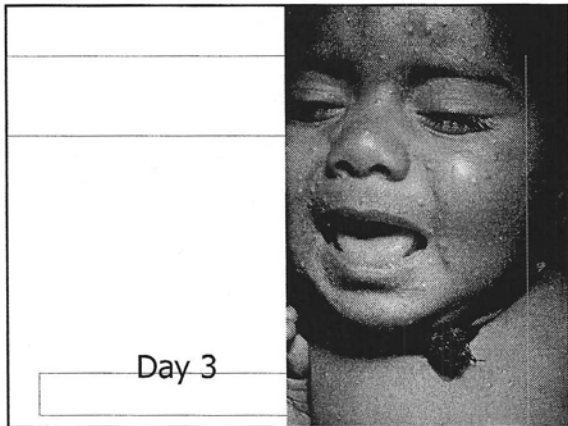
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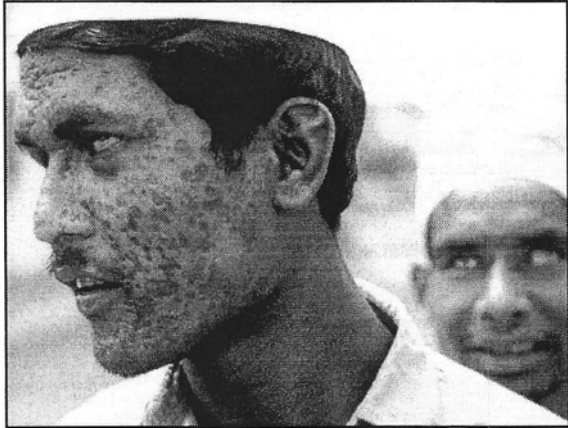


Smallpox, the disease

- Virus infection – more than 3500 years old
- Man is the only host
- Death rate was 30%
- Vaccine protects with one dose

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Global eradication programs

- Hookworm 1909-23 14 years
- Yellow fever 1915-32 17 years
- Yaws 1948-66 18 years
- Malaria 1955-73 18 years

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Global Smallpox Eradication

- 1953 – Director General proposes eradication
- 1959 - Assembly approves a USSR resolution...
...to be supported by voluntary donations
- 1966 – Assembly debates a new plan
10 year program --WHO budget of \$ 2.4
58 nations needed for approval
60 voted for it

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The Challenge

- Status of smallpox – 1967
 - >10,000,000 cases -- 2,000,000 deaths
 - 43 countries reported cases
- Program staff
 - Headquarters – 7 professionals; 5 in regional offices
 - International field staff – up to 150 in the field
Nationals from 70 countries; most under 40 years
Many were short-term - 3 to 12 months
Volunteer groups: U.S., Japan, Austria, U.K.
 - National staff up to 130,000

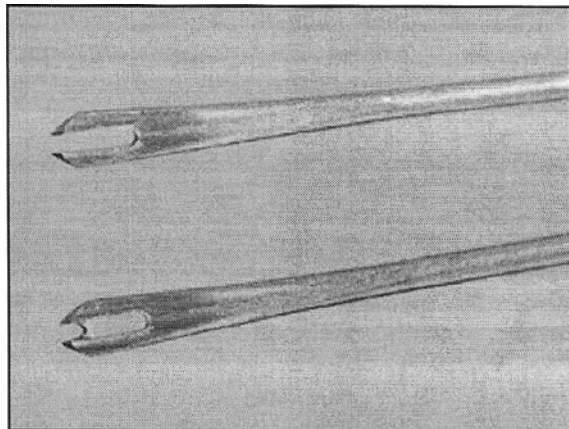
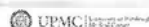
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Vaccination pace and quality

- Research to find faster, better methods
 - Jet injector gun
 - Bifurcated needle for multiple puncture
 - One vaccine vial vaccinates 100 instead of 25
 - Technique easy to teach
 - Needles are easily sterilized and reusable
 - Cost -- \$5 per thousand
- Quality control for all vaccine

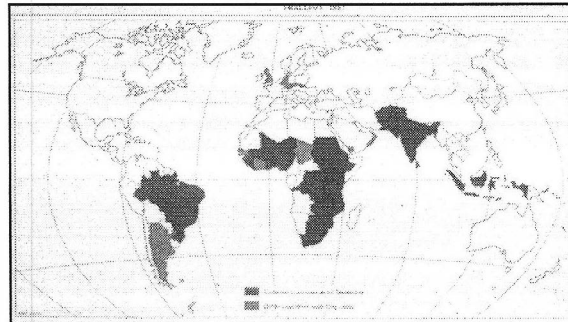
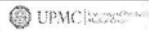
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The Basic Strategy

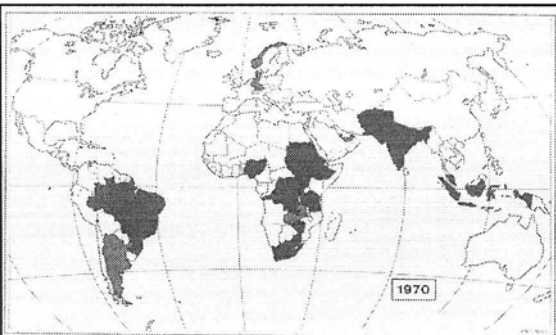
- Mass vaccination
- Surveillance-containment
 - Weekly report from all health units
 - Prompt vaccination around all cases
 - The textbooks prove to be wrong, e.g.
 - "Smallpox spreads like a prairie fire"
 - "Revaccination is needed every 3 to 5 years"

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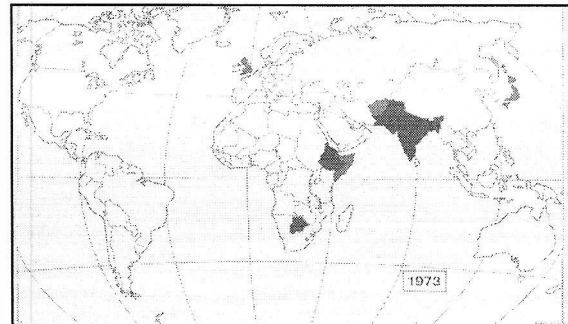
■ = Endemic countries
 ■ = Others with cases

Smallpox 1967



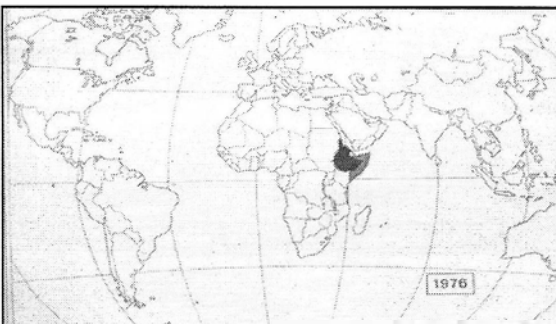
■ = Endemic countries
 ■ = Others with cases

Smallpox 1970



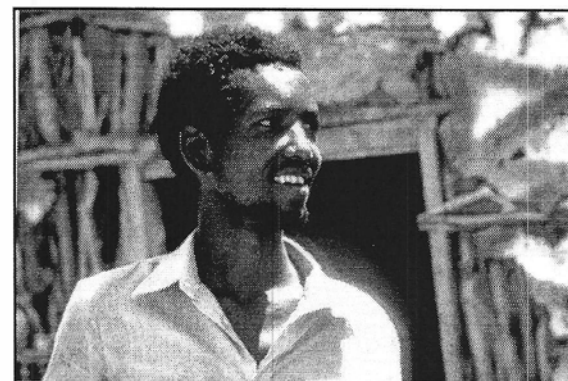
■ = Endemic countries
 ■ = Others with cases

Smallpox 1973



■ = Endemic countries
 ■ = Others with cases

Smallpox 1976



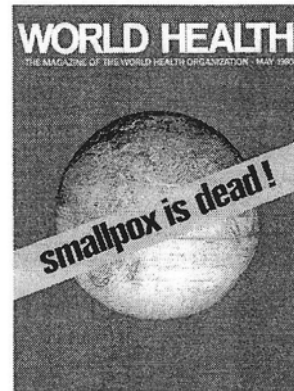
Ali Maalin - 26 October, 1977

World Health Assembly --1980

- Declares solemnly that the world and all its peoples have won freedom from smallpox
- Smallpox vaccination should be discontinued in every country

• *Thirtythird World Health Assembly, 8 May 1980*

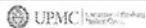
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"There has been no greater medical – or humanitarian – miracle in modern times than the eradication of smallpox. (The program) offers a winning blue print for the great medical challenges to come."

Professor David Oshinsky – Winner, 2006 Pulitzer Prize in History

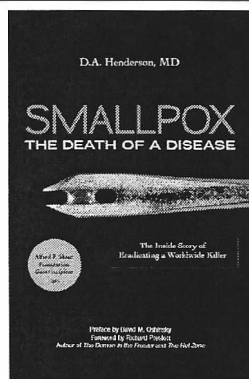
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Legacies

- Expanded Program on Immunization (EPI)—a new "Era of vaccinology"
- Potential of eradication and its problems
- A research agenda linked to program needs
- Need for surveillance to monitor progress and identify priorities
- Renewed confidence in WHO potential for international leadership
- Cadre of young professionals who discovered the challenge of public health

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PROGRAM

Symposium on Smallpox Eradication

Smallpox Eradication after 30 years: Lessons, Legacies and Innovations

AGENDA


DRAFT - August 10, 2010

(Please note this is a draft agenda, speakers are invited and/or tentative)
*Confirmed speakers

Day 1 - Tuesday, 24 August, 2010

Opening Ceremony

Co-Chairs: Paulo Gadelha*, *Ciro de Quadros**, Joel Breman*

18:00 - 20:00	Welcome from representatives: Ministry of Health, Brazil Secretary of Health, Rio de Janeiro University College, London WHO / PAHO (Mirta Roses*) Fiocruz, Brazil	 D.A. Henderson*
	Overview of the smallpox eradication program	
20:00	Welcome Cocktail Reception	

Day 2 - Wednesday, 25 August, 2010

Session I: Lessons from Smallpox-Endemic countries: Illuminating experiences in program conception and execution

Chair: D.A. Henderson

8:30 - 8:45	Brazil		Joao Baptista Risi*
8:45 - 9:00	West Africa		Bill Foege*
9:00 - 9:15	Democratic Republic of the Congo		Jean-Jacques Muyembe-Tamfun*
9:15 - 9:30	India	<i>Mahendra Singh</i>	<i>Ravinder Nath Basu*</i>
9:30 - 9:45	Bangladesh		Stan Foster*
9:45 - 10:15	Break		
10:15 - 10:30	Ethiopia		Ciro de Quadros*
10:30 - 10:45	Somalia		Abdulahi Deria*
10:45 - 11:00	Certification		Joel Breman*

9:00 - 9:15	✓ Guinea worm eradication	Frank Richards*
9:15 - 9:30	✓ Measles and rubella eradication	Ciro de Quadros* Jon Andrus*
9:30 - 9:45	✓ Onchocerciasis control	Boakye Boatin*
9:45 - 10:00	✓ National Immunization Program- Brazil - <i>AROUTA GPI</i>	Gerson Penna*
10:00 - 10:30	✓ Discussion	Oyewale Tomori* <i>NIGERIA</i>
10:30 - 11:00	✓ Break	
11:00 - 11:15	✓ Prospects for malaria eradication	David Brandling-Bennett*
11:15 - 11:30	✓ Neglected tropical diseases: combining control initiatives	Peter Hotez*
11:30 - 11:45	✓ Discussion	Dirk Engels*

Session IV: New Opportunities for the 21st Century

Co-Chairs: : Jaime Sepulveda*, Marie-Paule Kieny*

11:45 - 12:00	✓ Vaccines of the future	Gus Nossal*
12:00 - 12:30	✓ Discussion	Mike Levine*
12:30 - 14:00	✓ Lunch	

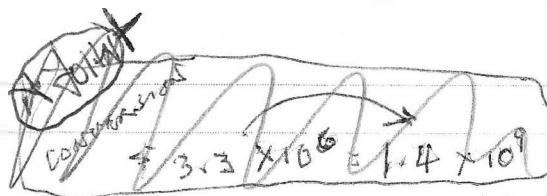
Session V: Cross-cutting lessons from smallpox and legacy programs and recommendations

Co-Chairs: Stan Foster*, Daniel Tarantola*

14:00 ²⁰ - 14:30	✓ Capacity building, (Individuals, Teams, Institutions)	Daniel Tarantola*
14:30 - 14:45	✓ Epidemiological surveillance	Larry Brilliant* <i>STEVE JONES</i>
14:45 - 15:00	✓ The role of research in disease eradication and elimination efforts: lessons learned	Mike Levine*
15:00 - 15:15	✓ Research	Marie-Paule Kieny*
15:15 - 15:45	✓ Administrative and technologic support, logistics, finance, communications	John Wickett*
15:45 - 16:30	✓ Discussion	
16:30 - 17:00	Break	

LESSONS FROM SPV - ALEXANDRE

1. Passion
2. Reduce complexities
3. Importance of words - keeping a record (By Red)
4. Surveillance
5. Research - important
6. Importance of institution - WHO



7. Remember to be what you want to see and it is working.

Hep B, Hib, Influenza, Polio, Rotavirus
INFO DESK

11:00- 12:30	Discussion	Mahendra Dutta Daniel Tarantola*
12:30 - 14:00	Lunch	<i>INFO DESK</i>

Session II: Orthopoxviruses: research and public health issues
 Co-Chairs: Svetlana Marennikova*, Don Francis*

14:00 ¹⁵ - 14:15 <i>+ 15</i>	Status of human monkeypox, epidemiology, and research	Inger Damon*
14:15 - 14:30	Genomic research of orthopoxviruses pathogenic for humans	Sergei Shchelkunov*
14:30 - 14:45	Human and animal infections by vaccinia-like viruses in Brazil	Monika Barth Schatzmayr
14:45 - 15:00	Major Increase in the Incidence of Human Monkeypox Thirty Years After Smallpox Vaccination	Anne W. Rimoin*
15:00 - 15:45	Discussion	Pierre Formenty*

Session III, part 1: Principles and lessons learned for planning, implementation, research and evaluation
 Co-Chairs: Paulo Gadelha*, Jon Andrus*

15:45 - 16:00	The Expanded Programme on Immunization	J.M. Okwo Bele*
16:00 - 16:15	Discussion	Jon Andrus*
16:15 - 16:30	Break	

Session III, part 2: Historical Panel
 Co-Chairs: Paulo Gadelha*, Jon Andrus*

16:30 - 18:00	Regional and national Smallpox Eradication Programs: comparative historical perspectives	Sanjoy Bhattacharya* Gilberto Hochman* Claudia Agostoni*
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Day 3 - Thursday, 26 August, 2010

Session III, part 3: Principles and lessons learned for planning, implementation, research and evaluation (continued)
 Co-Chairs: Paulo Gadelha*, Jon Andrus*

8:30 - 8:45	The principles and feasibility of disease eradication	Walter Dowdle*
8:45 - 9:00	Polio eradication	Benise Aylward* Okwo Bele*

** New PSI Strategic Plan 2010-2012*

18:15

Session VI: Historical Panel

Co-Chairs: Jaime Benchimol*, Akira Homma*

SP1 oral, 15 min

17:00 - 18:30 History of vaccine, vaccination development and deployment

Niels Brinnes*
Paul Greenough*
Tania Fernandes*

- Team arrived for May 21 WHA - USSR on agenda for Maria mtg. Andon G. Krumov, WHO vaccine stayed 3 months

Day 4 - Friday, 27 August, 2010

Session VII, part 1: Lessons from smallpox eradication and legacy programs that can contribute to 21st century challenges

Co-Chairs: Mirta Roses*, Paulo Buss*

8:30 - 8:45 The Jenner Society - a new academic society for vaccinologists

Andy Morgan*
Georgina Roland*

** Jenner letter to Jenner* *Andy Morgan @ BRISTOL, AZ, UK*

Session VII, part 2: Historical Panel

Co-Chairs: Mirta Roses*, Paulo Buss*

8:45 - 10:15 Science and health diplomacy: smallpox eradication, The Cold War, International Cooperation and Human Rights

Marcos Cueto*
Cristiana Bastos*
Daniel Tarantola*

Session VII, part 3: Lessons from smallpox eradication and legacy programs that can contribute to 21st century challenges

Co-Chairs: Mirta Roses*, Paulo Buss*

10:15 - 10:45 Demographic and epidemiological trends and imperatives for the 21st century

Jeffrey Sachs*

10:45 - 11:00 Break

11:00 - 11:30 From Smallpox eradication to the Future of Global Health: Innovations and application Eradication vs: Control

Ojewale Tomori*

11:30 - 12:00 Role of Campaigns

Julio Frenk*

12:00 - 12:30 New science and the conquest of diseases

Carlos Morel*

12:30 - 13:00 What the future holds in global health

Tadatoka Yamada*

12:00 - 13:30 Closing Address

Paulo Gadelha*
Mirta Roses*

most important achievement in public health is health, or not control of pathogens

1) POLITICAL WILL

2) INNOVATION + WILL TO LEARN

3) FINANCIAL SECURITY

ENVIRONMENT IS POSSIBLE FOR CHALLENGES

13:30 = TOUR OF CASTLE

** Julio Frenk - Great speaker, just what we need for health work in international context*

Commission on Human Security 2001 - includes Health Security

1) Epidemiological 2) Health Care 3) Financial security

26 FOCCA → (41)
Plan

Coalition - people who are pro/anti 30/rev.

Quality improvement - continually improve

Did not realize that was racist in head to provide

✓ Pass. 40 - 55 Surveillance/contaminant.

MAYEMBE 00 - (5)

JHATA (18) - (38)

FOSTER - 38 - (53)

GIRO 25 - (40)

DEAN (55)

JOEL (12:15)

Spain workers had a different way of thinking

TRANSPORTATION	
6:15 P.M	7:20
Lunch - presenters -	
Tos	

Guided tour - reception trip

OKWO - BELLE - EPI

"REDS" Reach Every District

ANDRUS

Directing Council - comprising reps. from all countries.

- 1) Beyond legal and fiscal space. Identify new revenues to sustainably the intns. of new vaccines
- 2) Support mortality reduction targets. Traces HPV - RV - flu - pneumo.
- 3) Utilize PAFs Revolving Funds for vaccine procurement.

30th Anniversary of Revolving Fund.

95% of all vaccine purchased for national immunization from national resources. \$1.800 billion in 2007-2008 Only 26 x 10 from international sources.

Policy Influence - Vaccine development.

2

SHANDY - (Scholarship) funds - Sweden was in tech transfer??

OKANDIA

1952 - smallpox vaccine mass stopped.