Date	Nov 19 1999
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Title	Prevention and control of common infectious diseases
Event	Breakfast meeting
Event Sponsor	Scientific Committee of Prince Mahidol Prize
Event location	Bangkok, Thailand
Notes	
Publ as	

BREAK ROOM

Prevention & Control of Common Infectious Diseases — Nov. 15, 1999

Broad subject / not to be adequately covered in 20 min. /
Take up a component of this subject – the application of vaccines in their prevention.
To provide a brief historical look at our utilization of vaccines in their control –
and, in recounting what is, in fact, a very checkered, sometimes dismal saga, hope to illuminate certain problems and principles of which we need to be aware as we look to the future in the development and use of vaccines.

1993 World Bank's World Health Report
Remarkable document
Costs and benefits of all manner of medical and public health interventions and procedures.
Top of the list – vaccines of ~~many different~~ all types; providing the most added (quality) years of life for money invested.
To most of us in public health – not a surprise
Widespread use surprisingly recent and still far short of their potential
~~Why not more widely used?~~
+ Decision makers – curative physicians (radiation therapy; ICUs, etc.)
+ Pharmaceutical and medical device manufacturers

Beginning and implementing vaccination programs – an uphill battle – financial support has been difficult

Vaccines – a uniquely powerful tool.
1, 2, 3 doses – DONE! vs. vector control, behavioral modification, antibiotics — AIDS
Not everywhere applicable but where possible, eminently worth pursuing.

Best of ~~these~~ all vaccines – SMALLPOX – and smallpox the most serious of all infectious diseases
Single dose – 90% eff 20 yrs. – developing countries
By 1950 – heat stable for 4 months at 45°C.
Easy to administer — Cheap – 1¢ / dose.

Smallpox eradication – never suggested until 1953
– raised again 1958
– WHA 1966 – contentious debate
2.5×10^6 ($50,000 / country); hoped for contributions of 5×10^6 / year — Received $70,000 for 5 yrs.
Why? failing malaria eradication campaign – $2 billion program.
Credibility of WHO and public health at stake *(a lesson as we look to other erad. progs.)
UNICEF announced it would give no money to the program and they did not!

Eventually – 10 yrs. + 9 mos. later – last case occurred – Oct 77 / Vac stopped everywhere /
total costs, just under 100×10^6 — [illegible] w.w.; 20x the cost every yr.

- Use of vaccines very limited
1969 - March proposed rubella conference -
Cockburn / BAHT transform this to an all vaccine antigen conference. - (AT THAT TIME 5% (measles, polio - 6 yrs.) (DPT - nearly 20))
Consensus proposal for vaccines which all children should receive
"Expanded Program of Immunization". - accepted by Assembly 1974
1983 - 20% Slow acceptance. UNICEF & Rockefeller.
1990 - 80% most countries.
[illegible] - 1985 - Americas - decision for polio eradication - succeeded 6 yrs. later
1988 - Decision for global eradication with target of year 2000.
So far, so good - but beneath the bright scenario, there have been problems. They merit attention.
1) Quality control
+ Vaccines - spot vs. non-UNICEF purchased - DPT >50%
+ Program vaccine coverage - tabulated by vaccinators.
Surveillance - ultimate measure
Smallpox & polio in Americas 1985 [illegible] reports/monthly → 1989 20 000 units weekly.
Global - none until 1994, some only began 2 yrs. ago.
No data on other diseases.
2) Research - not promoted; not supported; in fact, not welcome among many p.h. types.
+ Smallpox - vaccine strain & production methods
vaccination device
new disease - monkeypox.
duration of immunity
ease of spread
At end - tissue culture vaccine
+ EPI - DPT, polio, measles - same vaccines as 35 years ago - none fully satisfactory
- EPI sponsored no [illegible] research program -
in fact, opposed to even have someone assigned to fashion a research effort.
- 1988 - mtg. c̄ Jim Grant - Polio - more stable; more antigenic DPT 5%
Killed by UNICEF Council

3) What of additional vaccines. – Hib; Hep. B; Y. F.;
what of (dengue) malaria, Tb, HIV?

Bottom line is that we have only begun to deal with the common inf. diseases by vaccination.

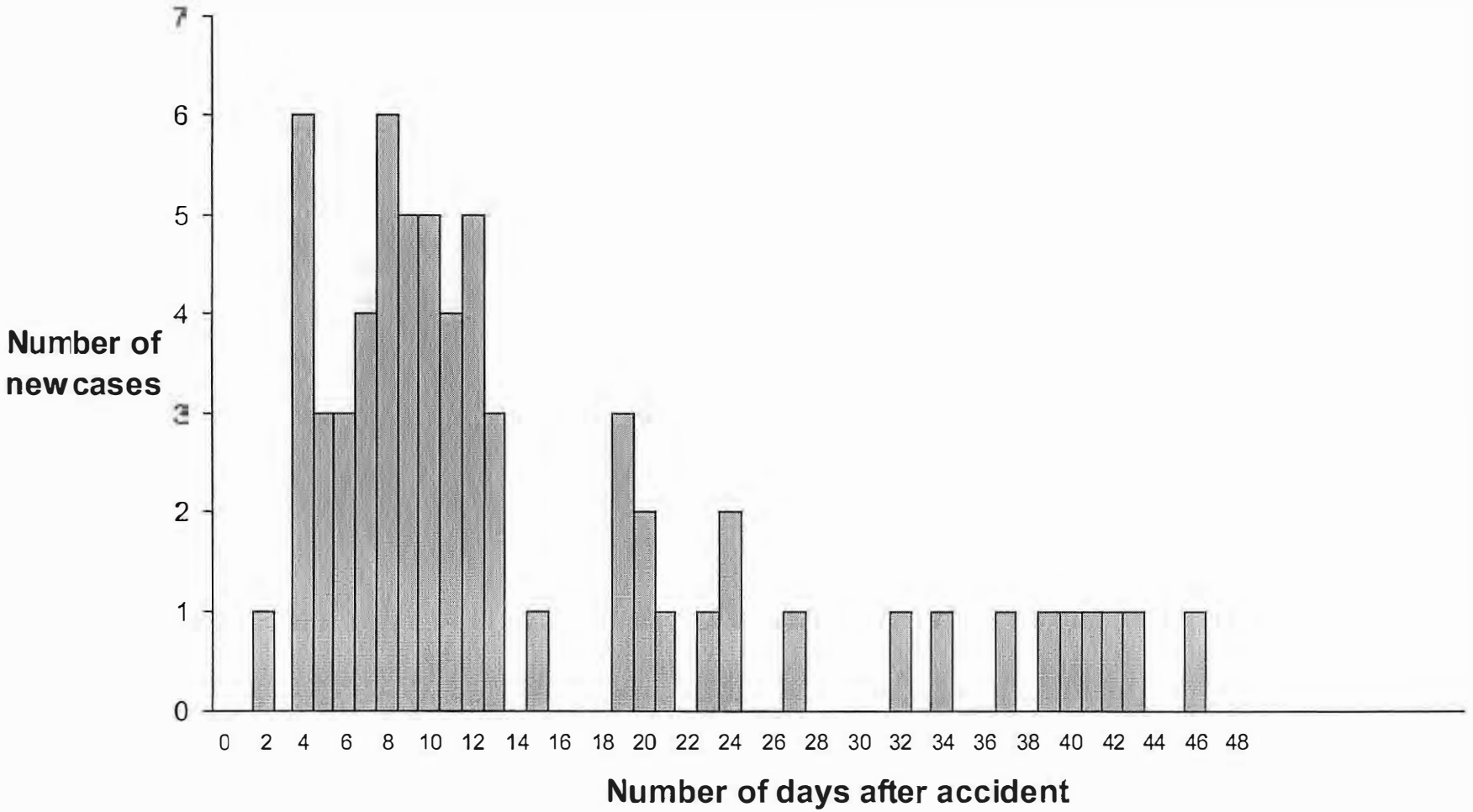
Last 6 months – Nearly $200 million pledged by Gates.
Active discussion of a $750 million pool of resources.
A Global Vaccine Partnership Coalition (outside WHO) created c̄ Dr. Tore Godal as chair.
New leadership by Dr. Gro Brundtland.

I believe the promise of the vaccines is so great & will be realized.

VACCINES VS.MAJOR BIOWEAPONS

	Anthrax	S'pox	Plague	Tul./~~Trach.~~	H fever
Vaccine	K (L)	L	K	L	None
Pre-exposure protection vs.					
Natural inf.	Yes	Yes	Yes	Yes	None
Aerosol inf.	Yes	Yes	No	?	None
Post-exposure protection	Yes	Yes	No	No	None

Figure 1: Day of onset of inhalational anthrax following Sverdlovsk accident



J. Guillemin, "Detecting Anthrax. What We Learned from the 1979 Sverdlovsk Outbreak." Presented at NATO Meeting on "Scientific and Technological Methods of Distinguishing between [illegible]pons Attacks and Natural Disease Outbreaks," October 17, 1998, Prague

ANTHRAX VACCINE

Inactivated vaccine – a cell-free filtrate

Principal component – protective antigen

Six dose schedule in 18 months

Reactions: minimal

Problems:

- Vaccine standardization
- Number of doses

Use for vaccine

- First responders
- Prevention after an attack
- Prophylaxis for contaminated area