



WHO Rapid Response Antiviral Stockpile

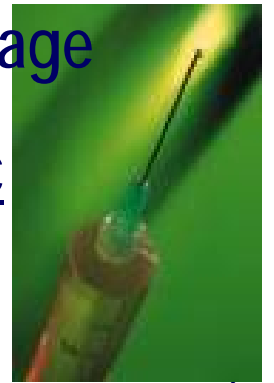
Influenza pandemic vaccines: challenges and opportunities

Klaus Stöhr



Take home messages

- Strong surveillance and response networks for early detection
→ every day counts!
- Vaccine production and access is limited but solutions exist to shorten the gap
 - Proven principles for effective pandemic vaccine production
 - Shared responsibility by stakeholders in health
- Radical solution possible: R&D can resolve shortage of pandemic vaccines and low seasonal vaccination coverage
- Considering shortages in medicines: national pandemic preparedness in developing countries remains key and requires operational plans for urgent action



WHO Rapid Response Stockpile

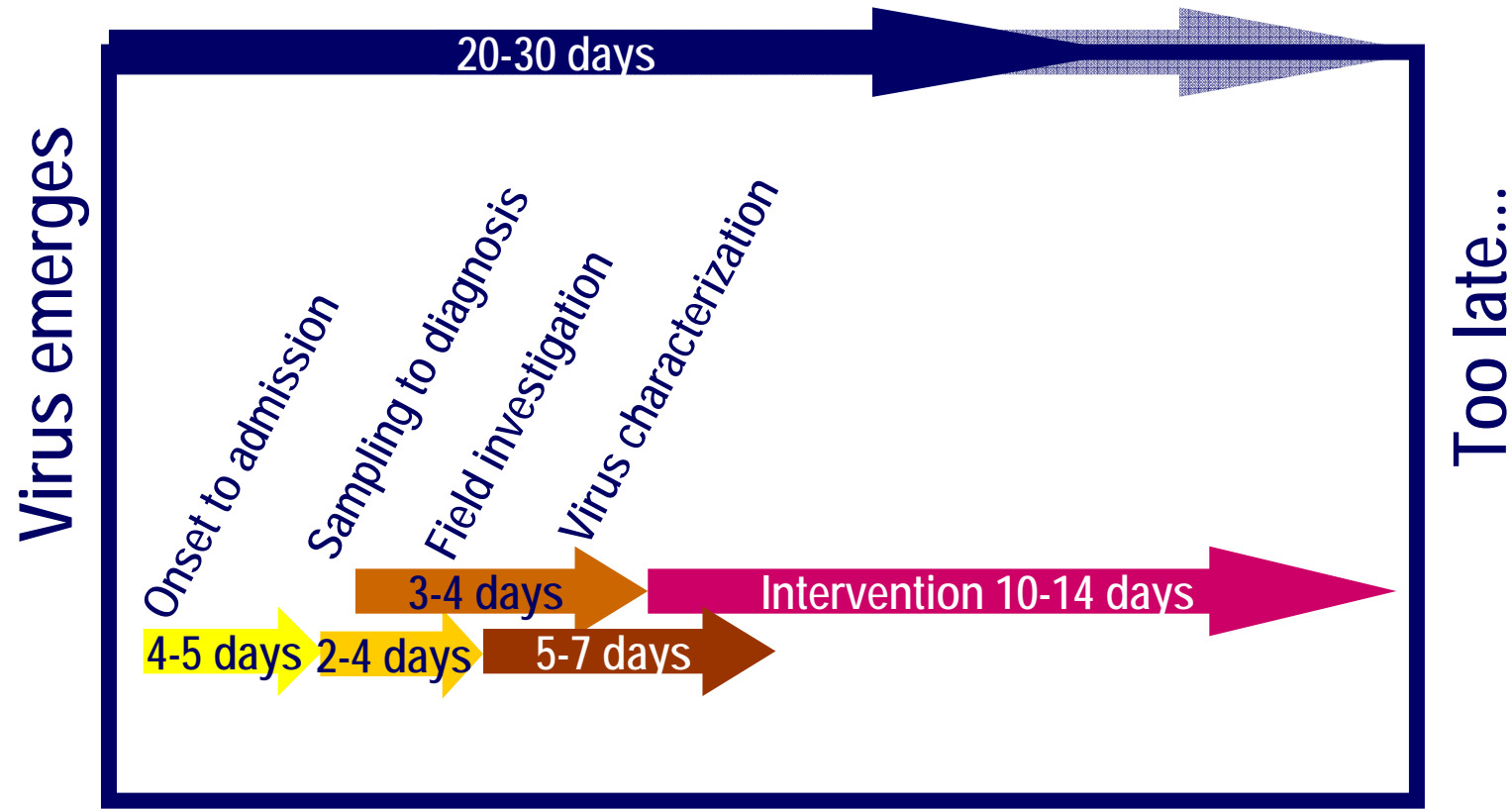
Objectives and Use

- Global availability for use in country(ies) first hit
- Goal: extinguish pandemic virus before further spread from the source
 - Conditions : early detection when outbreak is still localized; moderate virus transmissibility
- Size: 3 mio by 03/06 (1 mio 12/05)
- Warehousing, rotation, transport: company
- Rapid deployment in the field: national authorities



Elimination of a pandemic virus at its source!?

- Feasible if (only 1-3 million treatments needed):
 - $R_0 < 1.4$: antiviral prophylaxis of 80% of a population within 20 days
 - Movement restrictions; compliance rate etc.



Antivirals

National stockpiles

- National stockpiles

- Size will depend upon national strategies and possibilities
- Current status: + 40 countries



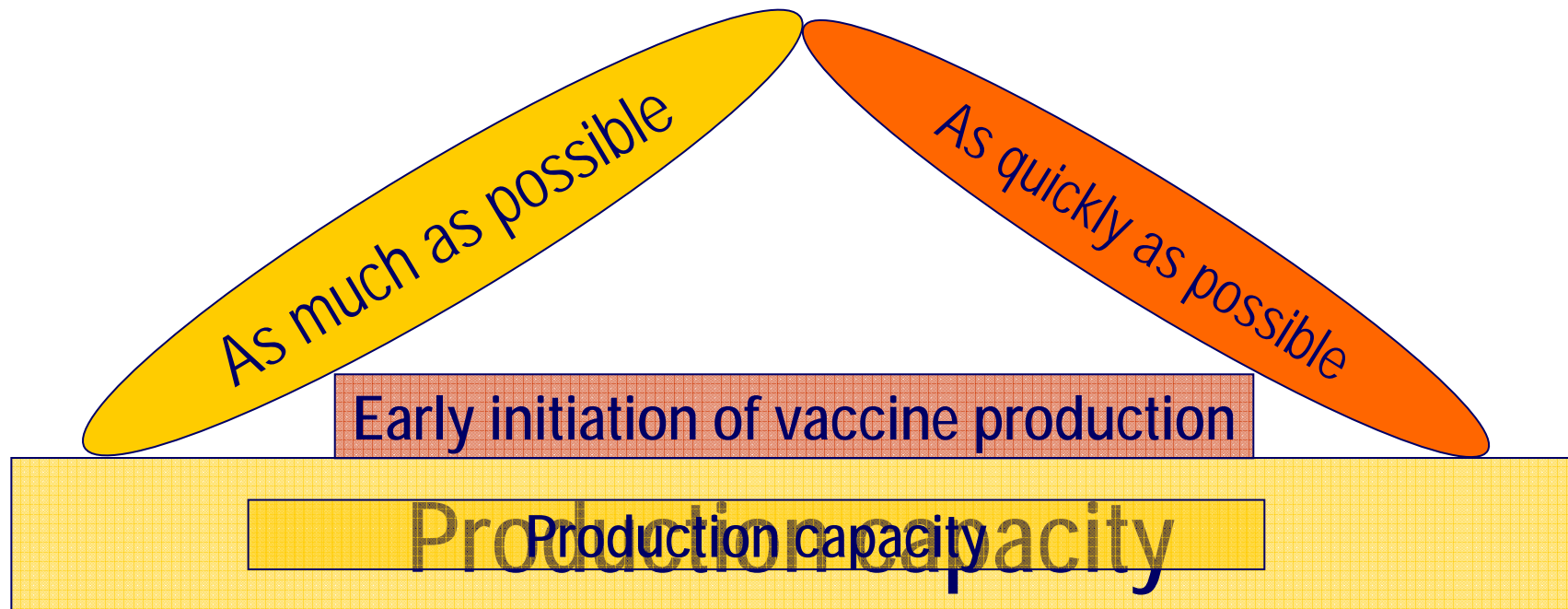
- Taken everything together: <2% of world population
- Access limited: production capacity and affordability

- Needs to overcome limited access: operational plan

- Mid-term solutions appear most viable
 - increase global manufacturing capacity → coordinated efforts
 - R&D → new combinations; new approaches!!!

Influenza Pandemic Vaccines

- Goal: equitable and timely access



Influenza Pandemic Vaccines

Production capacity

- Current status + smart pandemic vaccine composition

300 mio

900 mio



→ Smart vaccine composition

H3
H5?

- Reduce antigen content (antigen sparing) + adjuvant (immune enhancer)
- 2001: Proof of concept with virus
- 2002: WHO Meeting with FDA/NIH
 - Major obstacles identified and addressed
 - Clear regulatory pathways
 - Boost research by vaccine manufacturers on smart vaccine compositions

- Further convergence of regulatory approaches for pandemic influenza vaccines (developing and developed countries)

→ 2 meetings scheduled 1Q/2006

Influenza Pandemic Vaccines

Production capacity

Company	Ag-sparing	Clinical trials			Paperwork
		Planned	Ongoing	Finished	Done
1	NO				
	YES	H5N1			
	YES				

- Regular review of progress and coordination:
→ several H5N1 trials ongoing
- Antigen sparing is likely to work; some uncertainties exist
- Realistic scenario: 900 million doses in 8 month
→ considering current production capacity provided antigen sparing strategies are pursued
- Antigen sparing research: comparatively cost-effective

8	YES	H5N1			
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- H5N1 antigen sparing
 - Finished: 0; Ongoing: 3; Planned: 8



Influenza Pandemic Vaccines

Production capacity

- Current status + smart pandemic vaccine composition

300 mio

900 mio

1800 mio



→ Smart vaccine composition

→ New application forms: intradermal vaccination (ongoing)

- Possible doubling of pandemic vaccine doses (by 900 million)
- Costs: comparatively low
- Prospect: considerable level of uncertainty



Influenza Pandemic Vaccines

Production capacity

- Current status + smart pandemic vaccine composition

300 mio

900 mio



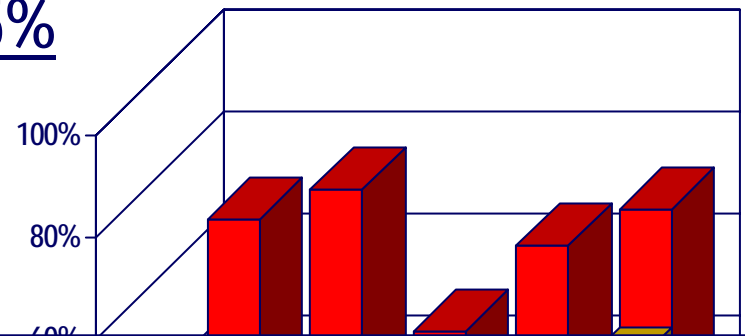
- Smart vaccine composition
- New application forms: intradermal
- Increase seasonal vaccine coverage: developed countries

Influenza Pandemic Vaccines

Production capacity

- Increase vaccination coverage of seasonal influenza vaccine in developed countries to 75%

- Age groups over 50
- Groups at high risk for complications



- Outcome

- Significant decrease in disease from seasonal influenza
- Cost-effective reduction in health care implications (cost-savings)

- WHO ready to provide support to increasing influenza vaccination coverage

- Increase in global vaccine production capacity by 60%

Influenza Pandemic Vaccines

Production capacity

- Current status + smart pandemic vaccine composition

300 mio

900 mio

1440 mio



- Smart vaccine composition
- New application forms: intradermal
- Increase seasonal vaccination coverage: developed countries
 - By 60% thus reaching WHO's vaccination target for 2010
 - Costs: cost-effective/cost-saving intervention

Influenza Pandemic Vaccines

Production capacity

- Increase seasonal vaccine coverage: developing countries
 - Building factory for influenza pandemic vaccines only may not be feasible
 - Decision on seasonal influenza vaccination policy
 - Assessment of national vaccination policy
 - Allow for priority
- Seasonal influenza vaccination might be feasible in a few developing countries only

- WHO ready to provide support for developing countries
 - Development of national vaccination policy including comparative costs
 - Training national regulations
 - Exploring possibilities for technology transfer



Influenza Pandemic Vaccines

Production capacity

- Current status + smart pandemic vaccine composition

300 mio

900 mio

1710 mio



- Smart vaccine composition
- New application forms: intradermal
- Increase seasonal vaccination coverage: developed countries
- New/extended seasonal manufacturing capacity (including cell-culture vaccines)
 - By 2008: + 270 million doses



Influenza Pandemic Vaccines

Production capacity

- Current status + smart pandemic vaccine composition

300 mio

900 mio

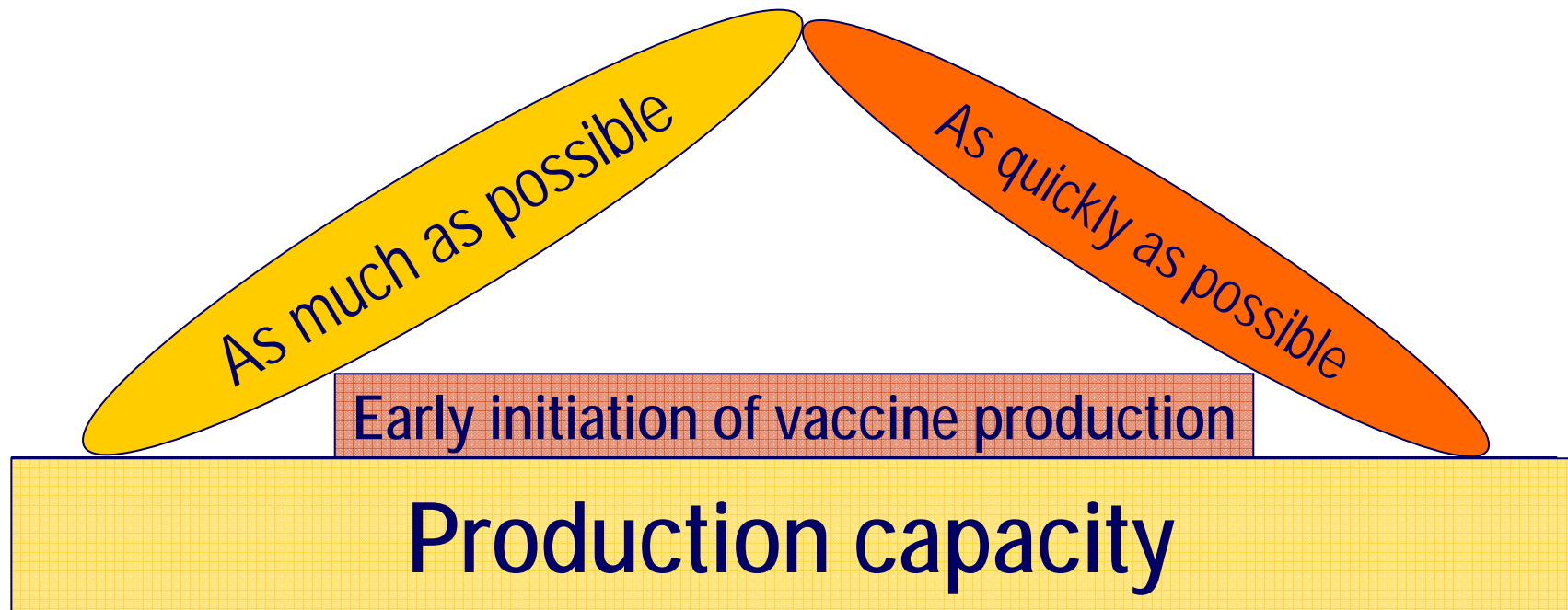


- Smart vaccine composition
- New application forms: intradermal
- Increase seasonal vaccination coverage: developed countries
- New/extended seasonal manufacturing capacity
- H5N1 vaccine use in seasonal vaccine
- Advanced vaccines and production technologies

Influenza Pandemic Vaccines

Early initiation of vaccine production

- Goal: equitable and timely access



Influenza Pandemic Vaccines

Early initiation of vaccine production

Realistic: 3.75 million doses per day

● Opportunities

- Early outbreak detection, diagnosis and notification
 - Days to weeks → 11 to 80 million doses
- Access to emerging pandemic virus
 - Days to months → 11 to 112 million doses
- Prototype production
 - WHO In
 - Rapid a
- Pre-registration and production
 - → 112 to 224 million doses

- WHO Recommended Strategic Actions: responding to the pandemic threat
 - Section 2: Strengthen the early warning system

528 mio

134 mio

any



Influenza Pandemic Vaccines

Early begin of vaccine production

- Goal: equitable and timely access

R&D to find radical solutions to
- seasonal vaccines issues and
- pandemic vaccine shortage?

Production capacity

Influenza Pandemic Vaccines

Research and Development of Influenza Vaccines

- Seasonal vaccine: estimated value for purchasing 28.3 billion

- Global Influenza Vaccine Procurement and Research Mechanism?

- Model: WHO/PAHO Vaccine Procurement

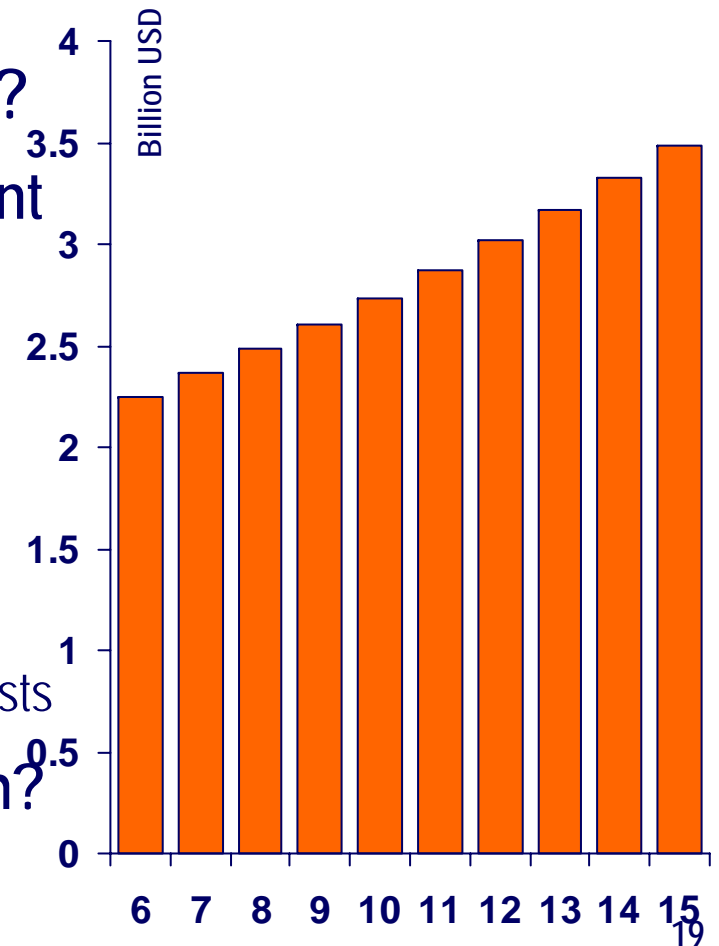
- Defined procurement arrangements
- Self-sustained

- Effects

- Increased vaccine up-take; more predictable vaccine market
- Reduced public health investment + vaccine costs

- Savings: invested into vaccine research?

- WHO is looking for partners



Influenza Pandemic Vaccines

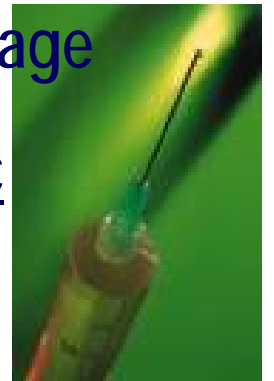
Shortening the pandemic vaccine gap: Conclusions

- Short- and mid-term solutions exist
 - Production capacity
 - R&D (Ag sparing + new applications): Conditional for vaccine development!
 - Increase in seasonal influenza vaccine use: ↑ 540 million in 4-5 years
 - New/expanded manufacturing capacities: ↑ 810 million in 2008
 - Early initiation of vaccine production
 - Stronger national and international early warning and response system + pre-registration of pandemic vaccines → 134 – 528 million doses
- ➔ Vaccine shortage will remain problematic for most countries
- Long-term, cost-neutral solutions exist to push R&D agenda for pandemic AND seasonal influenza vaccine



Take home messages

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→ every day counts!
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21

