Veterinary and human public health systems are the single most important area for productive investment on behalf of mankind*

Olga Jonas, Economic Adviser, World Bank

USDA ARS 3rd International Biosafety & Biocontainment Symposium: Biorisk Management in a One Health World

February 2-5, 2015 in Baltimore, MD

**Based on statement by Larry Summers at the World Bank, April 11, 2014*

Outline

1. Costs and benefits of One Health approach to control of **zoonotic diseases**
   - Evidence on **efficiency** (cost savings)
   - **Effectiveness**
     - Early warning
     - Large expected benefits to all countries **plus** substantial national and regional co-benefits

2. Ebola outbreak

3. Governance and financing of Global Health Security

Presentation based on:

World Bank Independent Evaluation Group (IEG): ***Controlling Avian Influenza - Learning from evaluation of the World Bank's efforts 2006-13*** (2014)

World Bank reports:

-- ***People, Pathogens and Our Planet***

Vol. 1: Towards a One Health Approach for Controlling Zoonotic Diseases (2010)

*Vol. 2: The Economics of One Health (*2012)

-- ***Managing Risk for Development , World Development Report 2014***

Chapter 8 on global risks

Jonas, O., ***Pandemic Risk,*** *WDR 2014 background paper*

-- ***Connecting Sectors and Systems for Health Results***, Public Health Policy Note (2012)

-- ***Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response: Project Accomplishments*** (forthcoming, spring 2015)

Potential Savings Achievable through the Implementation of the One Health Concept (1 of 3)

in 139 developing countries (60 low- and 79 middle-income countries) in “peacetime” and in emergency responses

TASK	INVESTMENT/ RECURRENT COST	SAVINGS %	SPECIFIC AREAS OF SAVINGS
Surveillance	Investment	10–30%	Joint transport and communication systems, as has been demonstrated in HPAI and other campaigns
Surveillance	Recurrent	20–40%	Shared front-line staff, as already has been demonstrated in many countries with paraveterinary system.
Bio-security	Investment	5–20%	Shared border control and abattoir and market inspection in buildings and equipment, as already done in several countries; sharing also possible with plant sanitary service.
Bio-security	Recurrent	10–30%	Shared border control and market inspection, with clear agreement on responsibilities. Sharing also possible with plant sanitary service.

Potential Savings Achievable through the Implementation of the One Health Concept (2 of 3)

in 139 developing countries (60 low- and 79 middle-income countries) in "peacetime" and in emergency responses

TASK	INVESTMENT/ RECURRENT COST	SAVINGS %	SPECIFIC AREAS OF SAVINGS
Diagnostics	Investment	5–25%	Joint facilities and equipment, as already done in a number of countries
Diagnostics	Recurrent	15–30%	Shared support staff, as already done and recommended in other countries
Control (vaccinations, hygiene, and rapid response)	Investment	5–15%	Shared quarantine of infected areas, as successfully done in highly pathogenic avian influenza campaigns
Control (vaccinations, hygiene, and rapid response)	Recurrent	10–30%	Shared staff and hygiene and awareness programs
Culling	Investment/ Recurrent	0%	
Compensation	Training	0%	
Additional costs	Investment/ Recurrent	5–10%	Of total budget
Research	Research	5–10%	Of total budget

Source: World Bank (2012). *People, Pathogens and Our Planet, Volume 2: The Economics of One Health.*

Savings Achieved by Implementation of the One Health Concept (3 of 3)

The Canadian Science Centre for Human and Animal Health in Winnipeg

• Officially opened in 1999

Main conclusions :

- One Health concept works, especially for lower-level containment laboratories and sharing of services
- Greatest efficiencies in surveillance (facilities, field staff, communication), common animal-human health diagnostics facility, common services

Operational costs of two separate facilities: **US$19.6 million/year** (US$12.3 million for human health facility and US$7.3 million for animal health facility)

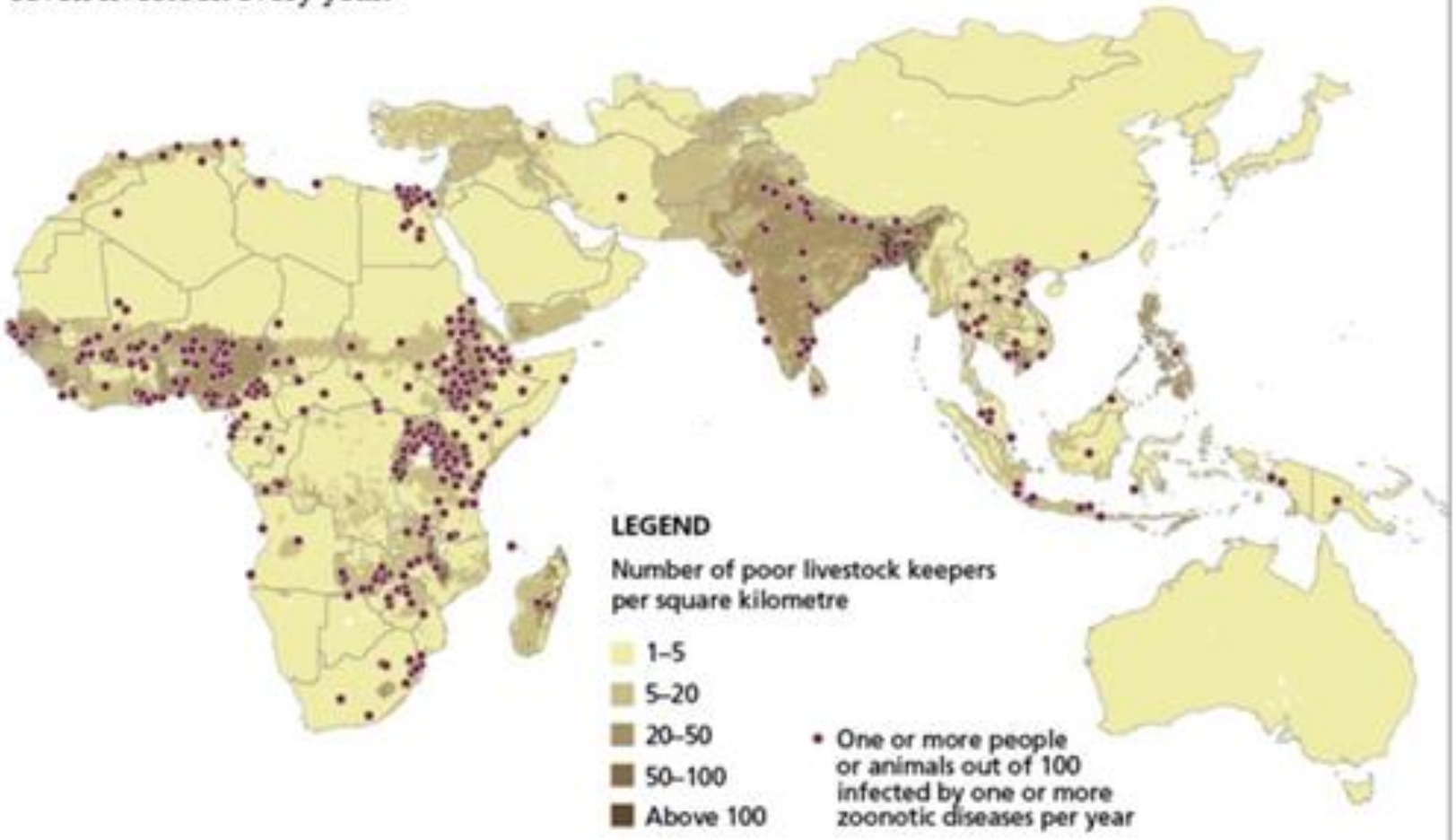
Significant cost savings to both sectors:

The operational costs of a joint facility are US$14.5 million per year, a saving of about US$5 million/year, or 26 % (6% coming from the HH services and 20% from the AH services)

Source: World Bank (2012). *People, Pathogens and Our Planet, Volume 2: The Economics of One Health*.

Greatest Burden of Zoonoses Falls on One Billion Poor Livestock Keepers

An ILRI study shows that zoonotic diseases are major obstacles in pathways out of poverty for one billion poor livestock keepers. The diseases mapped cause 2.3 billion human illnesses and 1.7 million human deaths a year. In poor countries, the diseases also infect more than one in seven livestock every year.



Map by ILRI, from original published in an ILRI report to DFID: *Mapping of Poverty and Likely Zoonoses Hotspots*, 2012.

“Even though we can't compute the odds for threats like bioterrorism or a pandemic, it’s important to have the right people […] taking steps to minimize their likelihood and potential impact.

Bioterrorism and pandemics are the only threats I can foresee that could kill over a billion people.”

– Microsoft Corporation Chairman Bill Gates, 2011

High-Level Panel on Universal Health Coverage

"What made a huge impression on me was this: The risk of pandemic flu. Optimists think that that risk is 1 percent a year.

I'm told that the WHO's budget for influenza is half that of New York City. If that is close to right, I wonder if the world is making the appropriate provision for something that could be cataclysmic in its impact."

– Larry Summers, Harvard University professor, former US Treasury Secretary and World Bank chief economist, Chairman of the Lancet Commission on Health, World Bank, April 11, 2014

Impact on the global economy

(Source: World Bank)

Updated to reflect 2013 GDP of $75 trillion

	Costs as % of GDP	Costs ($ trillion)
Mild pandemic	0.7	0.5
Moderate pandemic	2.0	1.5
Severe pandemic	4.8	3.6

Good news for global health security:

- ✓Scientific progress, information & communications technology
- ✓Understanding of risks -- and of human psychology
- ✓Experience with AHI responses (esp. at country and community levels)
- ✓International Health Regulations (IHR, 2005), OIE, WHO exist

Outbreak risk reduction is possible

Gaps in global health security

Examples:

- Human health sector – other sectors (incl. veterinary public health)
- Borders between countries
- Weak links because of low capacity
- Low priority of public health and of future disease burdens (high discount rate)
- Misperceptions, poor communications, myths, esp. about risk
- Disincentives to reporting
- Weak governance and accountability
- Absence of reliable and appropriate mechanisms (incl. financing) for **collective action**

‘One Health’ approach: stop contagion at its animal source

Weak veterinary capacity

→ little or no surveillance in animals

→ no disease control at the animal source

Exposure in humans

Clinical signs in humans

Cost of outbreak control

Humans seek medical care

Time →

Adapted from IOM (2009)

How much will it cost for all countries to have veterinary and human public health systems that meet WHO & OIE standards?

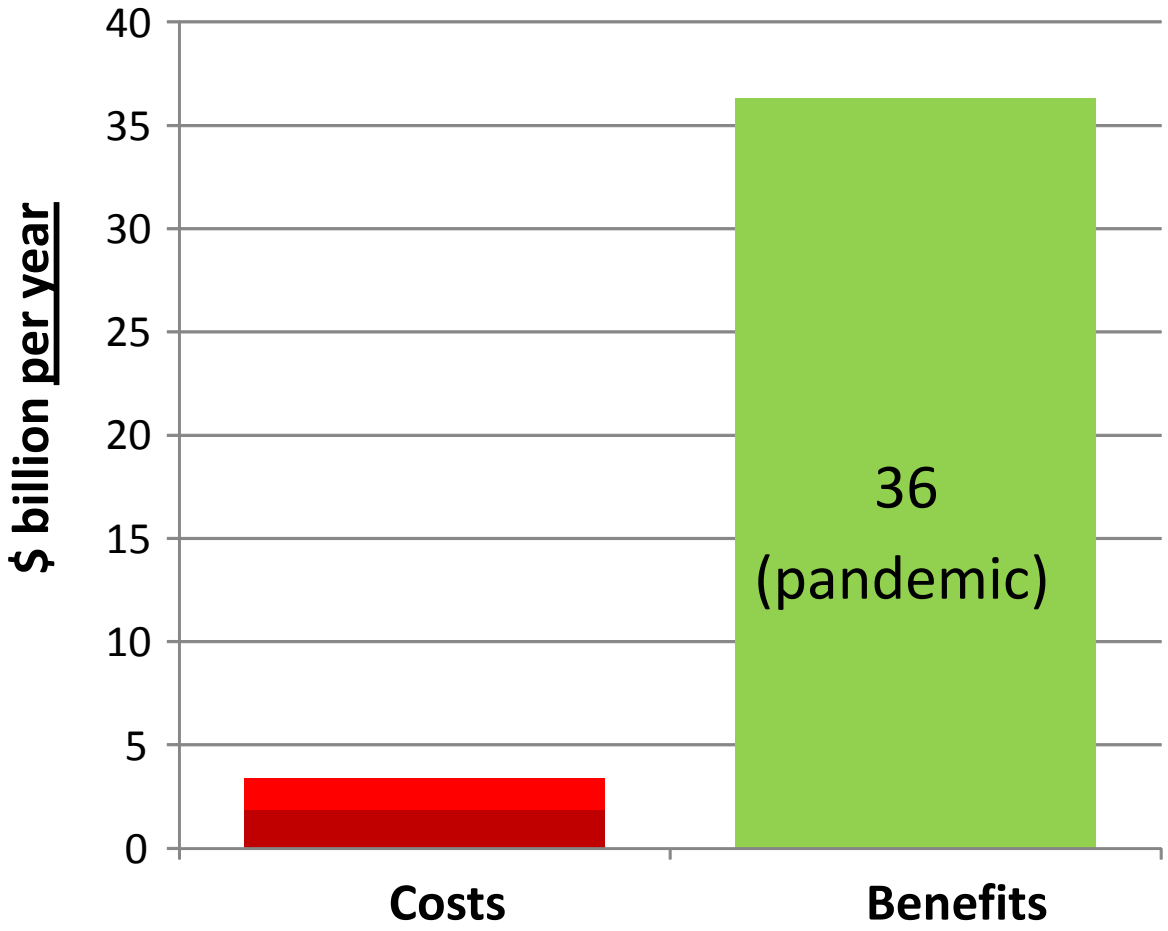
Total requirement to develop, maintain and operate such systems, including "One Health" bridges between systems in 139 developing countries

$ 1.9 billion – $3.4 billion per year

Note: actual annual losses in 1998-2008 from major zoonotic disease outbreaks averaged >$ 6.7b/year (i.e., double the requirement)

Requirement is about **8x more than current efforts** which have diminished since 2010.

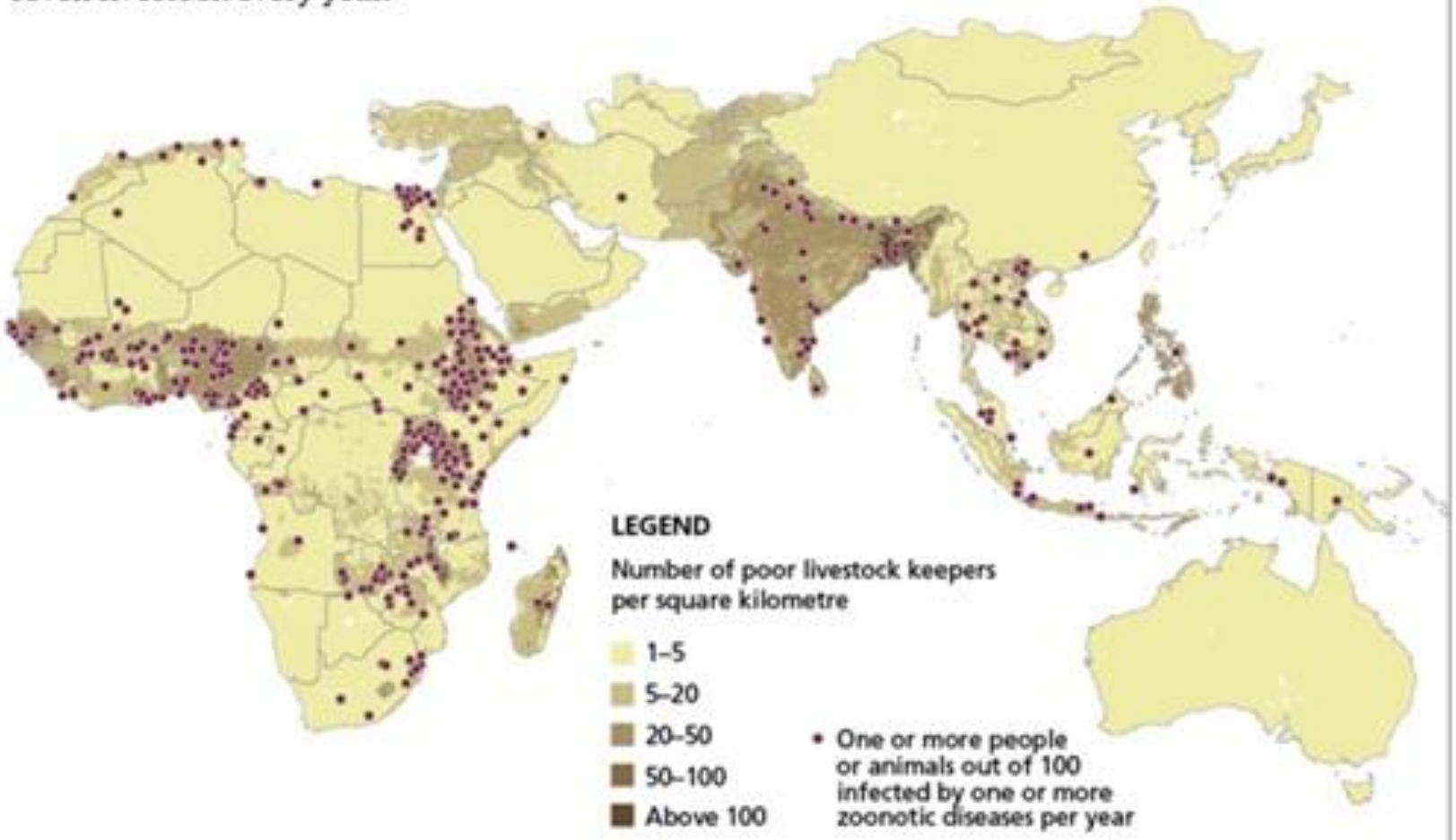
High Expected Pay-Off from Robust Veterinary and Human Public Health Systems: Reduction of Pandemic Risk



Expected benefit : cost ratio is 11:1.

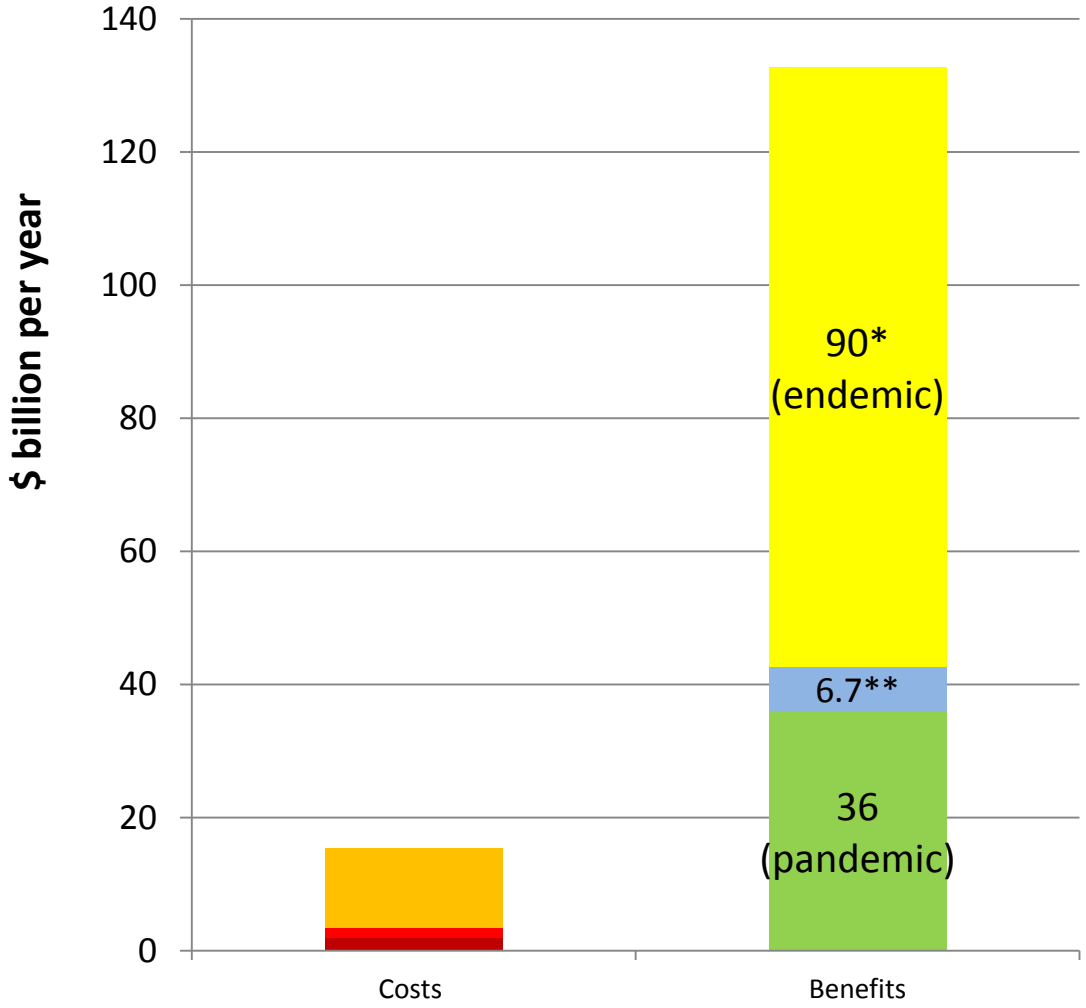
Greatest Burden of Zoonoses Falls on One Billion Poor Livestock Keepers

An ILRI study shows that zoonotic diseases are major obstacles in pathways out of poverty for one billion poor livestock keepers. The diseases mapped cause 2.3 billion human illnesses and 1.7 million human deaths a year. In poor countries, the diseases also infect more than one in seven livestock every year.



Map by ILRI, from original published in an ILRI report to DFID: *Mapping of Poverty and Likely Zoonoses Hotspots*, 2012.

Additional benefits from robust veterinary and human public health systems: reduce burden of livestock infectious diseases and endemic zoonoses*



With national and regional co-benefits and additional costs included, the benefit : cost ratio is 9:1

** Source: Delia Grace,. ILRI*

** $6.7b was the average annual cost of major zoonotic outbreaks in 1998-2009 that did not become pandemics.

Extraordinarily high expected rates of return

(even with high estimate of cost of preventive effort)

		Expected annual rate of return*
Success in preventing onset of pandemics	20% (only 1 in 5 pandemics prevented)	**25%**
	50% (only half of pandemics prevented)	**57%**
	100% (all pandemics prevented)	**86%**

* Severe pandemic flu case: Impact $3.6 trillion (4.8% of GDP), probability 1%, expected benefit of prevention $37 billion/year. Estimated costs of preventive effort (public health systems that meet WHO-OIE standards): $3.4 billion/year (high end of range). Note that the estimated benefits are only from pandemic risk reduction and do not include additional substantial national co-benefits from robust public health systems.

For details, see World Bank: *People, Pathogens and Our Planet , Vol. 2: The Economics of One Health* (2012)

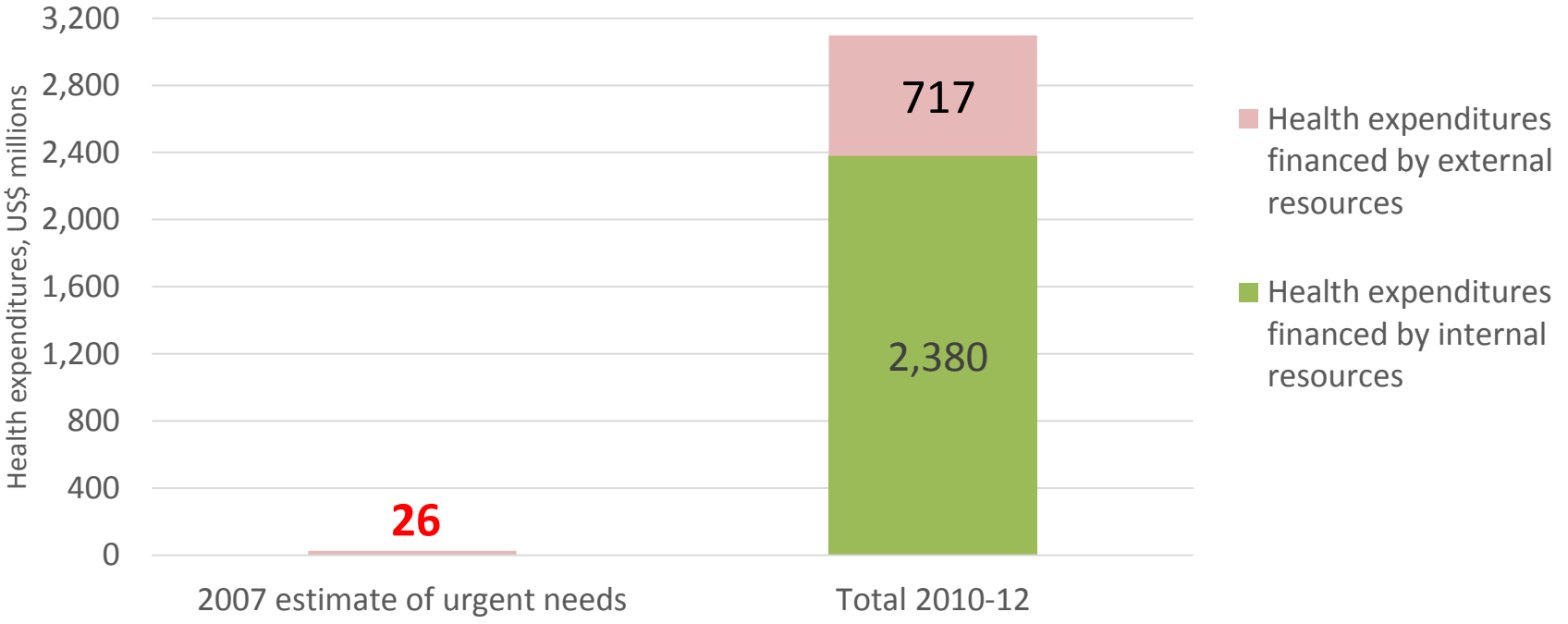
Integrated National Action Plans (INAPs)

(prepared in 2006-8 for outbreak preparedness)

- Part of avian flu response, TA from WHO, OIE, FAO, WB & others
- Most African countries prepared INAPs
- INAPs investments were generic and created capacities for early detection, correct diagnosis, and effective control of disease outbreaks.
- The laboratories, surveillance systems, trained epidemiologists, rapid response teams and other core capacities can (and should) be used to tackle other global and local health threats -- like MERS, cholera, antimicrobial resistance, Ebola, TB...
- **INAPs for Guinea, Liberia and Sierra Leone**, based on the experts' assessments, found that $26 million for the three countries combined is needed, to bring the countries' core public health functions to an acceptable standard of performance in disease outbreak control.
- The assessments and plans were the last step, unfortunately. **No advocacy for required investments by the partners of these countries.**

Misallocation within health sector: **most productive expenditure not done first, but last (if at all)**

Guinea, Liberia + Sierra Leone:
assessment of urgent needs in public health systems to control outbreaks



$26m is ~ 2.5 % of average annual health expenditure or ~ 3.6 % of 3-years of external assistance to health sector

Why is preparedness such a low priority?

Impact of the Ebola epidemic

Overemphasized costs (health sector expected to fund):

1. Health (22,500 cases, 9,000 fatal … but malaria burden much greater) *

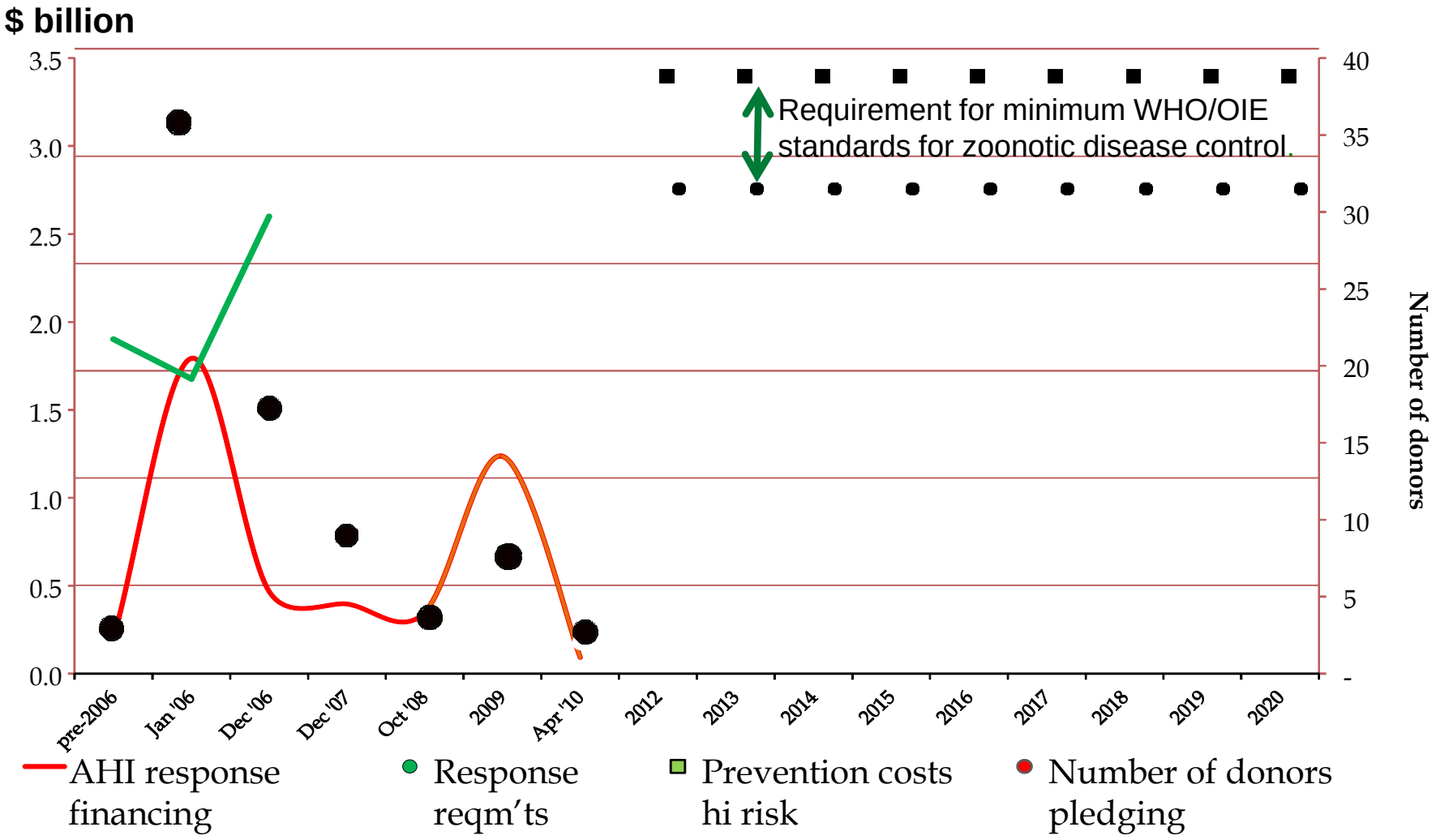
vs.

Underappreciated costs (imposed on disparate sectors and actors):

2. **Health care services** (health sector expected to fund) **
3. Economy - $6b (WB, January 2015) (funding unclear, increased poverty) ****
4. Response costs - $4b (UNMEER) (ad hoc burdensharing, spontaneous coordination, accidental coalitions … adequacy uncertain) ****

Spending on **public health systems** (as opposed to **health care systems**) may not improve if there is little accountability for damage done by disease outbreak in 2., 3, and 4.

Responses to H5N1 avian flu and 2009 H1N1 flu pandemic



Ensure healthy lives and promote well-being for all at all ages

(Goal # 3 of the UN's 17 proposed Sustainable Development Goals for 2030*)

	Sub-goals	Global?
1	reduce the global **maternal mortality** ratio to less than 70 per 100,000 live births	No
2	end preventable deaths of **newborns and under-five children**	No
3	end the **epidemics of AIDS, tuberculosis, malaria, and neglected tropical** diseases and combat hepatitis, water-borne diseases, and other communicable diseases	**Partially**
4	reduce by one-third premature mortality from **non-communicable diseases (NCDs) and promote mental health** and wellbeing	No
5	strengthen prevention& treatment of substance abuse, incl. narcotic **drug abuse and harmful use of alcohol**	No
6	halve global deaths and injuries from **road traffic accidents**	No
7	ensure universal access to sexual and **reproductive health care** services	No
8	achieve **universal health coverage (UHC), including financial risk protection, access to quality essential health care**, and access to safe, effective, quality, and affordable essential medicines and vaccines for all	No
9	substantially reduce the number of deaths and illnesses from **hazardous chemicals and air, water, and soil pollution and contamination**	**Partially**
10	Implement Framework **Convention on Tobacco Control** in all countries as appropriate	**Partially**
11	**support research and development of vaccines and medicines that primarily affect developing countries,** provide access to affordable essential medicines and vaccines	**Partially**
12	increase substantially **health financing & health workforce** in developing countries, esp. in LDCs and SIDS	No
13	**strengthen the capacity of all countries, particularly developing countries, for early warning, risk reduction, and management of national and global health risks**	**Yes**

Global public goods share two qualities. First, their benefits are nonexcludable so that once a good is available, everyone in the world can enjoy it. Second, consumption of global public goods is non-rivalrous because consumption by one person does not reduce the availability to others, across nations.

What can be done ? (1)

All countries to adopt an **international goal**

- **to reduce pandemic risk (global public good)** and
- to generate significant co-benefits in developing countries

- Goal serves as an anchor for setting priorities at country and international levels (provides signal on need to ensure adequate supply of a global public good to international organizations as well as to countries)
- Goal motivates systematic monitoring and reporting.
- Goal ensures that international organizations carry out regular assessments of country, regional, global progress in building and operating robust infrastructure of defenses against pathogens (veterinary and human public health systems)

What can be done ? (2)

Goal:

- By 2030, at least 70% of all countries have public veterinary and human health systems meeting international standards
- **By 2050, all countries' systems meet international standards – no weak links left.**

Result: Global system of defenses exists, grounded in robust country systems. Poverty reduction, shared prosperity, health, global economy are more secure.

Governance: OIE-WHO (international organizations) oversight and technical assistance, to ensure standards. Links to global mechanisms, global risk assessments.

Intermediate goals and targets on countries undergoing assessments and progressing on agreed implementation of investments to reach standards

✓ **SMART: S**pecific, **M**easurable, **A**chievable and **A**ttributable, **R**elevant and **T**ime Bound

What can be done ? (3)

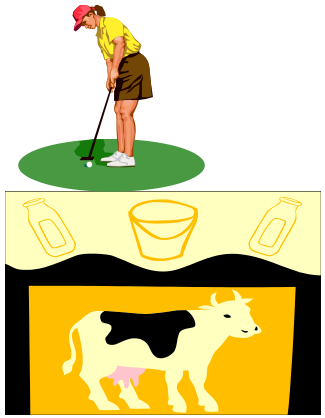
- Stable, adequate financing for developing countries' public veterinary and human health systems (~$3.4 billion per year). Agreed burdensharing within multilateral framework.
- Secure (dedicated) funding required for permanent, performing global infrastructure for national and economic security (not for "projects", "foreign aid" or even "health").
- In next 3-4 years, $120 million are required for technical assistance (TA)** with assessments of country veterinary and human public health systems and prioritization of capacity building.
- Develop programs in, and with, countries, for their systems that are interoperable with global system.

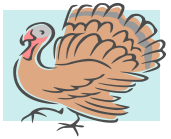
** This TA will ensure optimal implementation of the investments of $3.4 b/year.

pathogens

Human public health system

Veterinary public health system





Larry Summers and Michael Bloomberg urged a World Bank audience to pay more attention to pandemic risk

Pandemic risk-awareness is far too low.

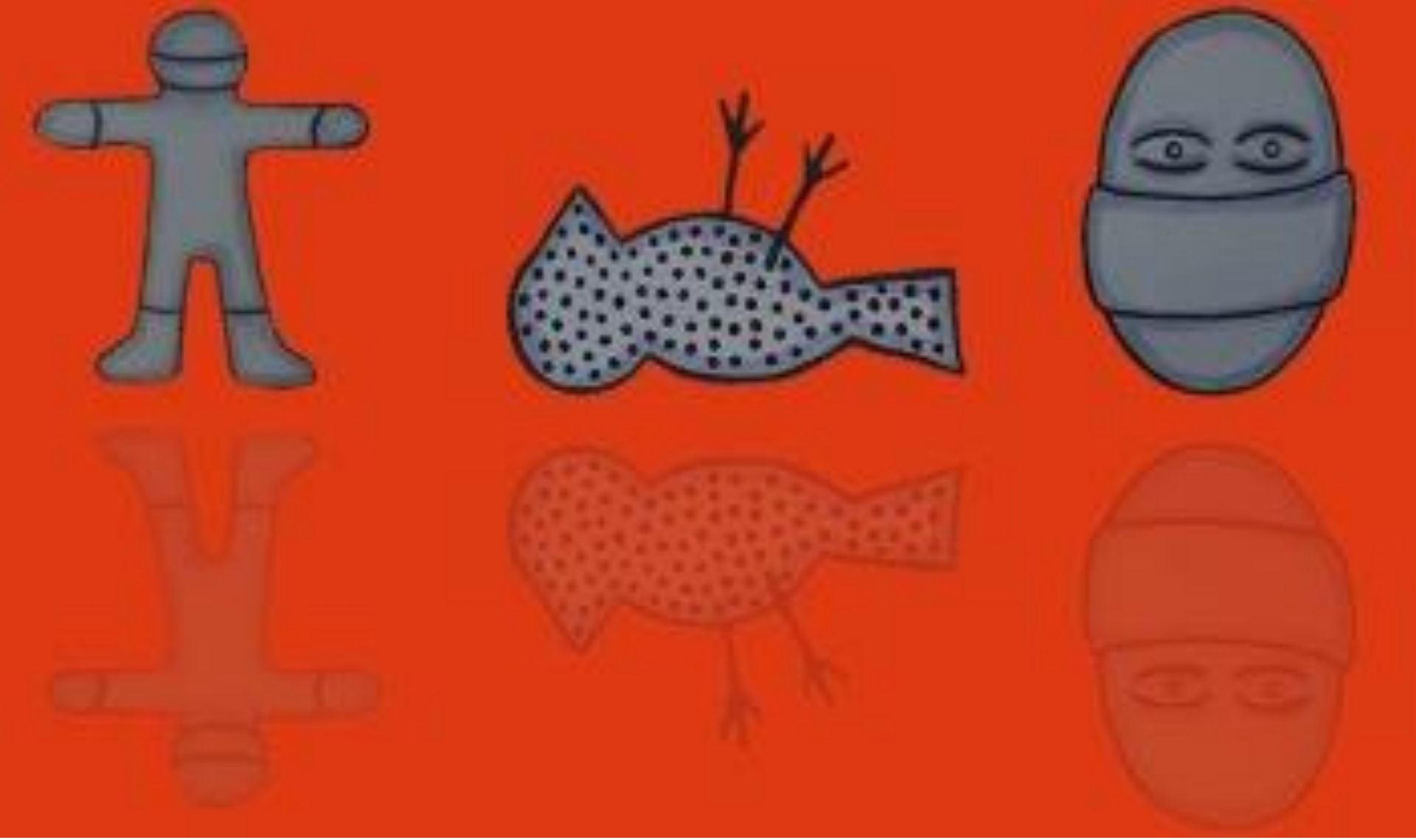
Watch this 3-minute video, produced by Olga Jonas (World Bank) and David Nabarro (UNSIC):
http://www.worldbank.org/en/news/video/2014/06/26/bloomberg-summers-urge-attention-to-pandemic-risk

Box 1. The single most important area for productive investment

Harvard University professor and former US Treasury Secretary Lawrence Summers said that, because pandemic risk is high:

"[veterinary and human public health systems are] probably the single most important area for productive investment on behalf of mankind."

Source: Video of high-level panel on health, World Bank, April 11, 2014, www.worldbank.org/pandemics



Thank you.

www.worldbank.org/pandemics E-mail: ojonas@worldbank.org

The young face worse odds

of experiencing at least one severe pandemic in their lifetime

Optimistic *assumption*: probability of pandemic onset is 1% in any one year

Before year	Years from now	Probability that at least one severe pandemic occurs during period
2031	16	16%
2061	46	38%
2101	86	58%