Meeting Africa's health challenges in the context of the African Transformation Agenda: What role innovations and health technologies?

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A preface of sorts …

- Research is seldom neutral to policy environment;
- Policy environment in large measure determines the allocation of scarce resources and in influences the choices individuals and organizations make;
- The policy environment in Africa in the short to medium term will be shaped by Agenda 2063 – and to some degree the outcomes of three UN Conferences next year in 2015:
  - The Financing for Development Conference (Addis Ababa, Ethiopia), July 2015;
  - The UN General Assembly in September at which the new SDGs will be adopted, and
  - UN UNFCC CoP 21 (Climate Conference) in Paris
- The outcomes of these conferences will determine the subjects of health research, its locus, funding and the direction of technological development for tropical diseases. And the type of medicine that will be practiced

Outline

- Introduction - The State of health in Africa
- The African Union's Transformation Agenda
  - Agenda 2063
  - Common African Position on the post-2015 UN development Agenda (CAP)
- Technologies and innovation for the achievement of Agenda 2063 and CAP
- Conclusions/recommendations/risks

The State of the Union's health

- Major challenges
  - Communicable and infectious diseases HIV/AIDS; Ebola; malaria, TB, and other infectious diseases;
  - Rising incidence of non-communicable diseases – Cancer and cardiovascular diseases
- Weak health systems
- Inadequate human resources for health;
- Inadequate application and diffusion of modern health technologies

The State of the Union's health cont'd

- Low life expectancy – 58 years (two years lower than SE Asia's);
- Twenty-four percent of the global burden of disease;
- Mortality rate of 1684/100,000;
- 47% of the burden of communicable and non-communicable diseases;
- Rising mortality from diabetes (12.1 million deaths)

The situation, although still dire, is not as hopeless as it seemed at the beginning of the century

- HIV/AIDS prevalence rates have fallen as have the rate of new infections;
- Child and maternal mortality rates have fallen;
- Number of HIV/AIDS-infected persons on treatment has risen from zero in 2001/2002 to levels unimaginable then;
- The burden of malaria has fallen;
- Most countries now have pluralistic health systems;
- Human resources for health has improved – both in quantity and quality

Technologies played a role in these recorded improvements…

- Improved health research;
- New technologies
  - ART and HAART for HIV/AIDS;
  - DOTS for TB;
  - Long-lasting Insecticide-treated bed nets for malaria transmission control;
  - Low-cost artemisin therapy to treat malaria in children and adults
  - Technologies for rapid diagnosis and tests;
  - Increasing connectivity and application of ICTs

But these achievements were thought not possible in 2001

- The MDGs helped to galvanise public and private efforts for health and health research and practice;
  - NGO's and governments protested efforts by Big Pharma to restrict access to life-saving technologies and drugs and transfer of technologies under TRIPS;
  - AIDS activism resulted in reviews of the regulatory environment, making it possible for new technologies to come on stream faster
- The AU Agenda 2063 (The Transformation Agenda) is capable of mobilizing actions for health as the MDGs have.

And on the wings of improved and still improving economic conditions

- African countries number among the world's ten fastest growing economies underpinned by deep reforms;
- Economic growth expands countries abilities to increase allocations to health R&D and health technology acquisition;
- The skills deficit is attenuating – driven in part by an increasing rate of return migration, the expansion of higher education and skill circulation;
- An indigenous wealthy class of entrepreneurs able to invest in R&D, hospital and diagnostics markets and technology is emerging in some of the major economies;
- Emergence of a strong middle class

The African Union's Transformation Agenda

- Agenda 2063 and its Seven aspirations;
- Common African Position on the post-2015 development agenda and its 6 pillars;
- Science Technology and Innovation Strategy for Africa, 2024 (STISA) and its goal of a technology and knowledge driven Africa

Aspirations of Agenda 2063

- A prosperous Africa based on inclusive growth and sustainable development;
- An integrated continent, politically united, based on the ideals of Pan Africanism;
- An Africa of good governance, respect for human rights, justice and rule of law;
- A peaceful and secure Africa;
- An Africa with a strong cultural identity, values and ethics;
- An Africa whose development is people-driven, especially relying on potential offered by its youth and women; and
- Africa as a strong, resilient and influential global player and partner.

Six pillars of the Common African Position on the post-2015 agenda

- Structural economic transformation and inclusive growth;
- Science, technology and innovation;
- People-centred development;
- Environmental sustainability, natural resources management and disaster risk management;
- Peace and security;
- Finance and partnership

Health in Agenda 2063

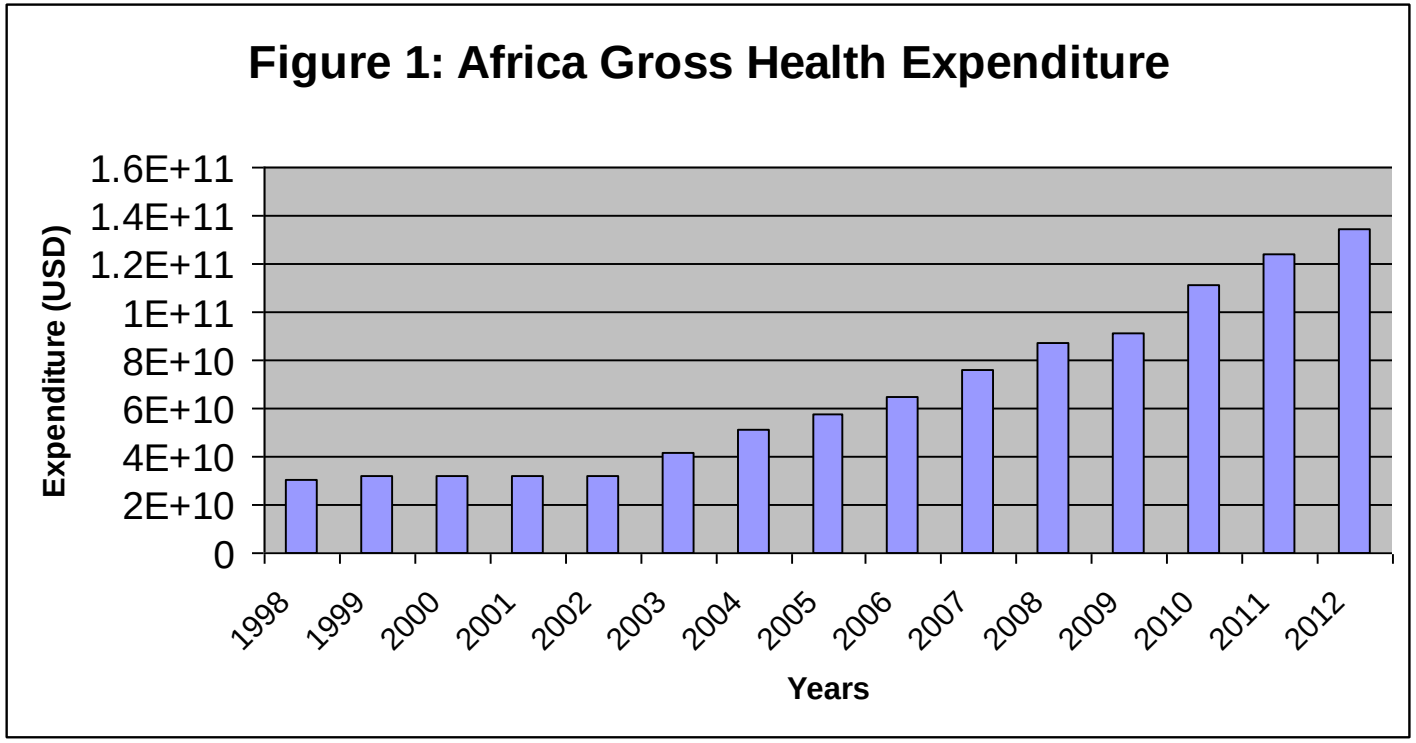
- *"By 2063, every citizen will have full access to affordable and quality health care services. Africa would have rid itself of all the neglected tropical diseases (NTDs),* ***fully brought under control all communicable and infectious diseases****; put in place systems for significantly reduced non-communicable and lifestyle-related diseases and reduced to zero deaths from HIV/AIDS, Malaria and Tuberculosis. The African population of 2063 will be a healthy one, well nourished, enjoying a life expectancy of above 75 years."*

Science, technology and innovation and Agenda 2063 and CAP

- Supported by a strong implementation and accountability framework;
- Supported by STISA – 2024
- Strategic Initiative 1 aims to “Consolidate African initiatives and strategies on accelerated *human capital* development, science and technology and innovation”.
- **STI is identified as one of the eight principal drivers**. The Agenda states “Africa’s sustained growth, competitiveness and economic transformation will require extensive investment in ***new technologies and innovation,*** including in education, ***health, bio-sciences,*** agriculture and clean energy…;
- Support by the the Pharmaceuticals Manufacturing Plan for Africa

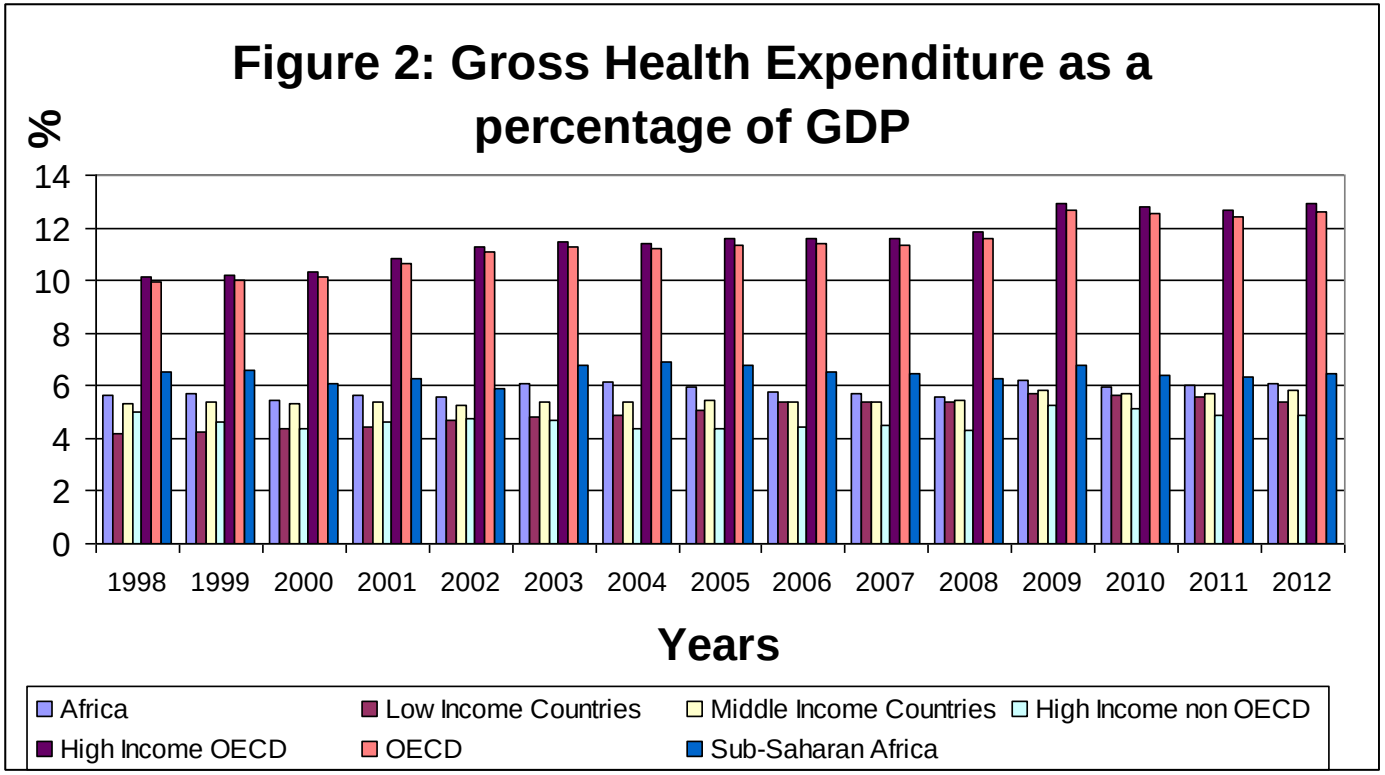
But the initial conditions are tough

- Gross Expenditure on health is rising over time but still less than the 15% Abuja Declaration target



Another way to tell the expenditure story

- Still below Abuja and less than other regions less hobbled by challenging health conditions spend on health as a proportion of GDP

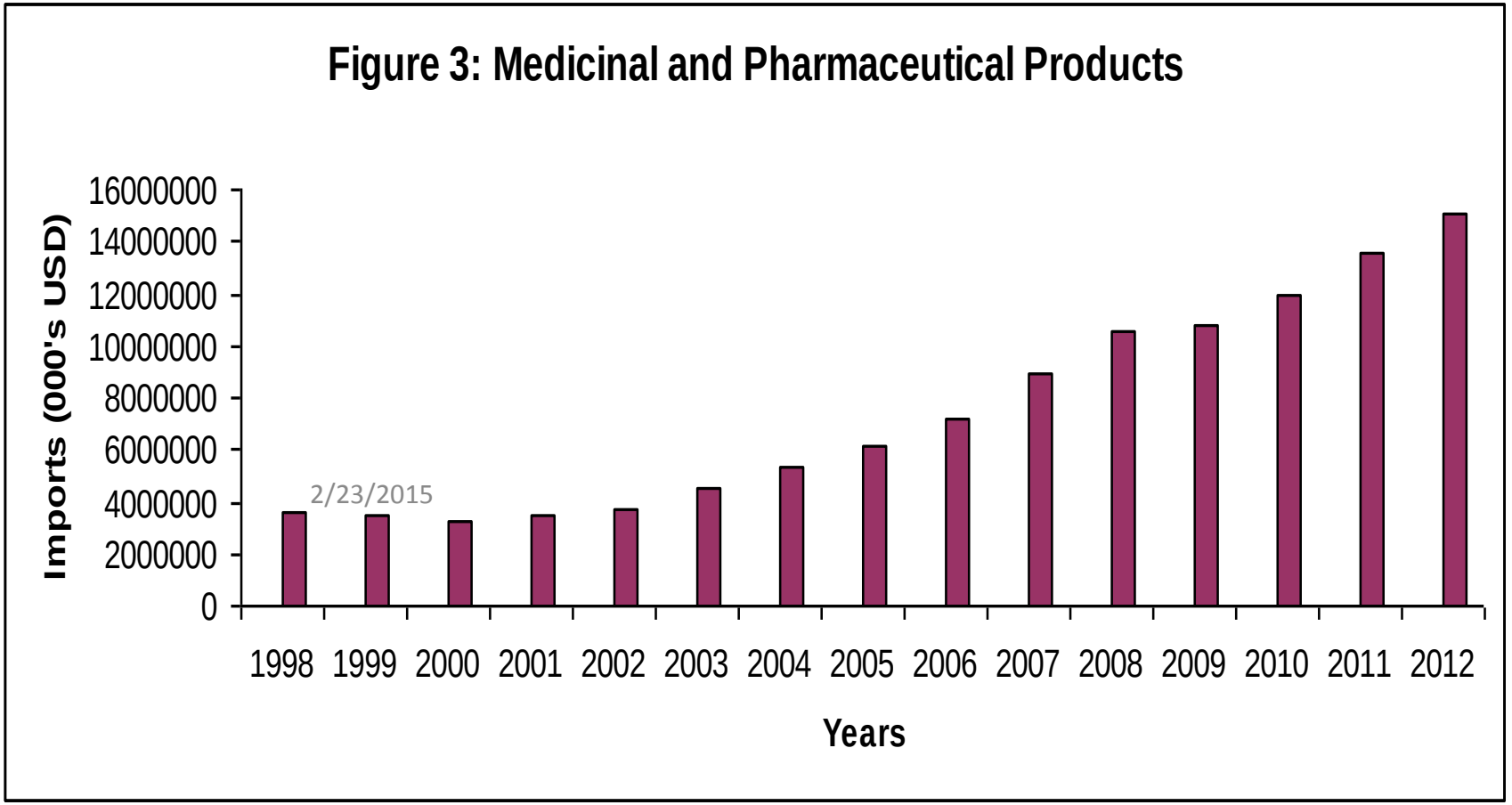


Import of health technologies – another health focus assessment metric

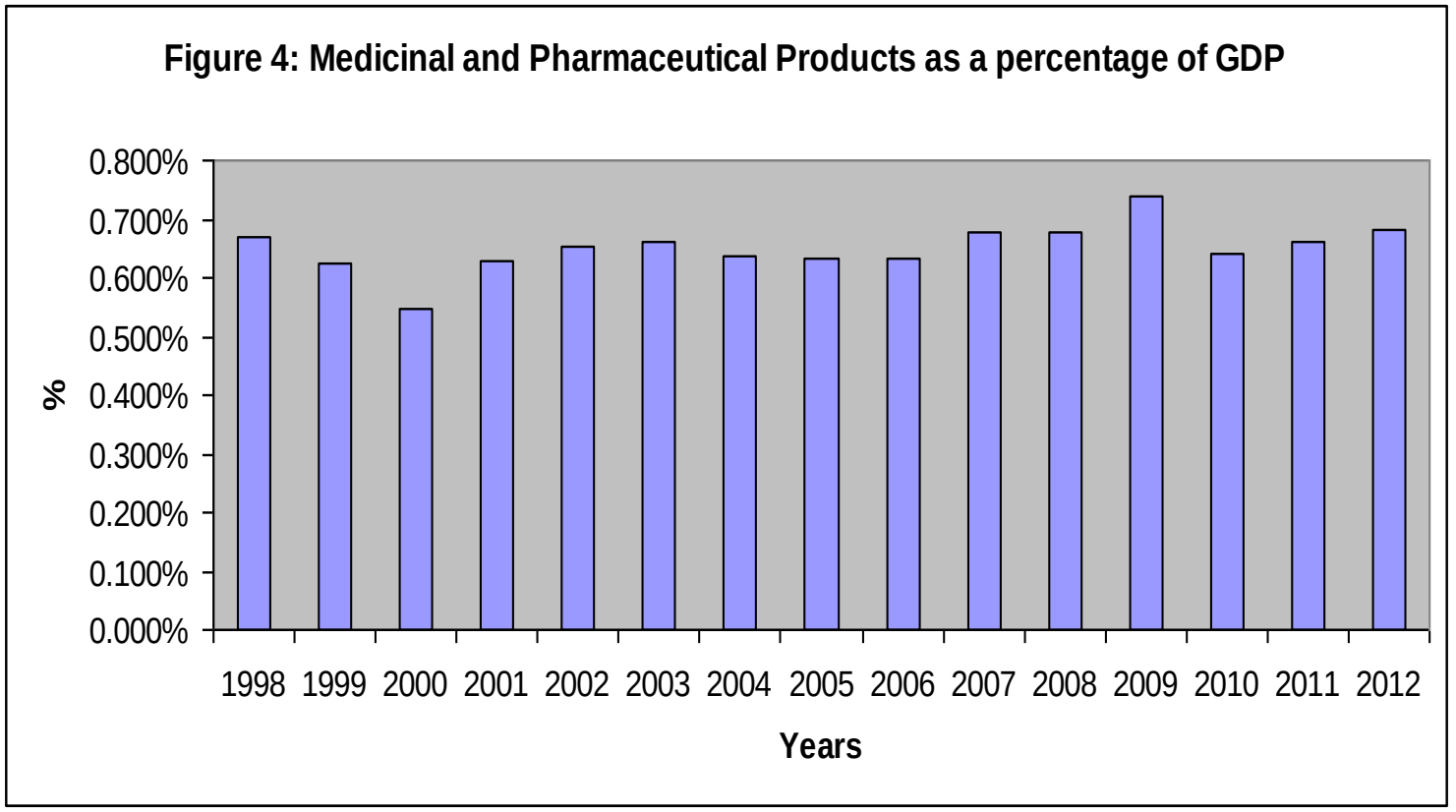
- Definition: 121st session of the WHO's Executive Board on the 8th day of May, 2007 defines health technologies, as:

  "the application of organized knowledge and skills in the form of devices, medicines, vaccines, procedures and systems developed to solve a health problem and improve quality of lives".

Africa's import of health technologies, 1998 - 2012



Expenditure on health technologies as share of GDP



Source: UNCTAD database

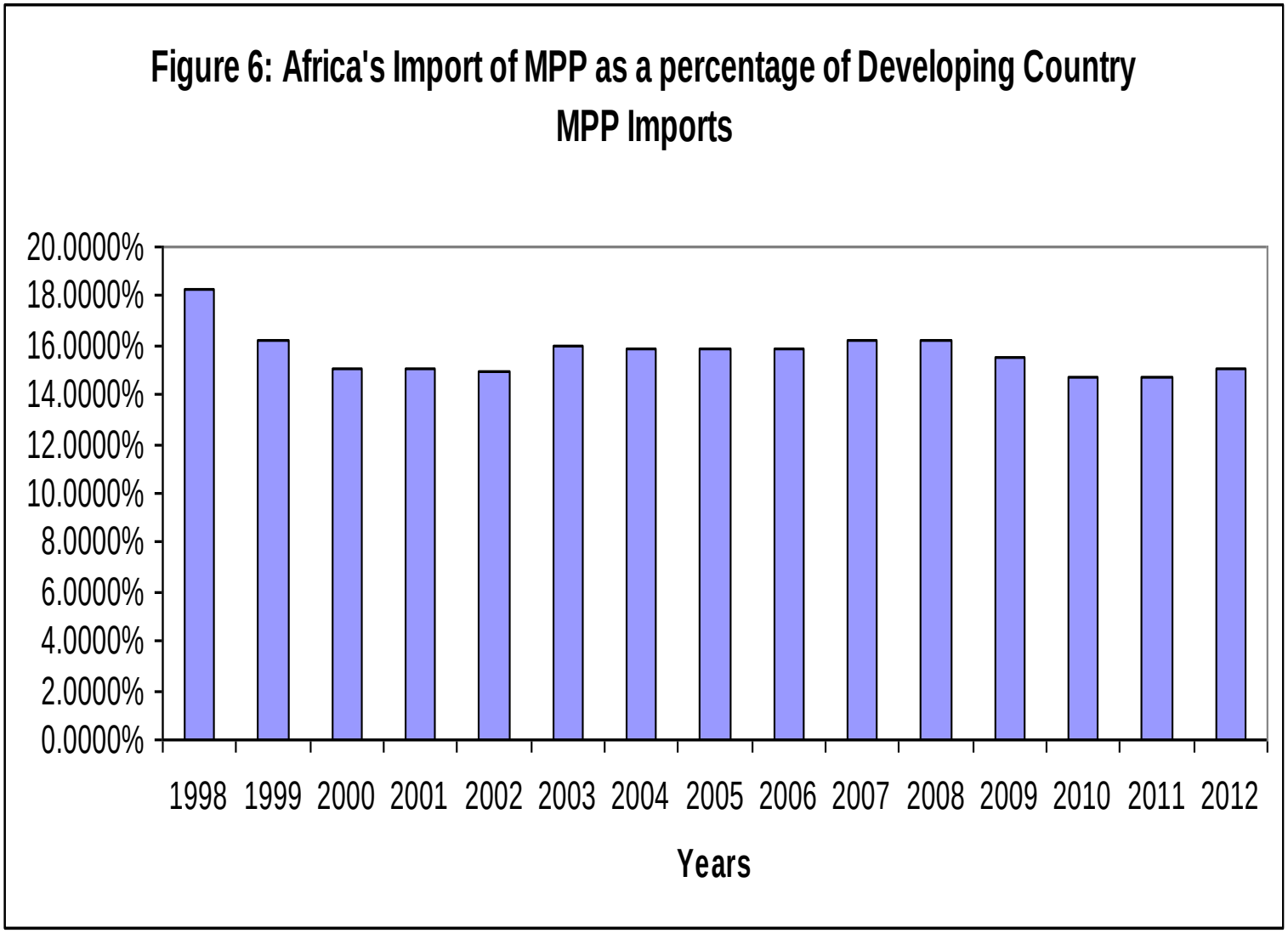


Figure 6: Africa's Import of MPP as a percentage of Developing Country MPP Imports
20.0000%
18.0000%
16.0000%
14.0000%
12.0000%
10.0000%
8.0000%
6.0000%
4.0000%
2.0000%
0.0000%
1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012
Years

African Health Research Publications count, by year

YEAR	Record	% of total (2559)	% of global total
2004	120	4.689	0.6015
2005	92	3.595	0.5467
2006	109	4.259	0.6656
2007	168	6.565	1.1091
2008	211	8.245	1.4309
2009	256	10.004	1.8705
2010	305	11.919	2.474
2011	384	15.006	3.3374
2012	426	16.647	4.1565
2013	488	19.07	5.1439
Total for the period	2559		

Source: Thompson Reuters Web of Science – Analysis by ECA, 2014

Top 12 Publishers of health research on Africa, 2003 - 2014

Institution	Record	% of total
University of London, UK	287	11.215
University of Cape Town, RSA	248	9.691
London School of Hygiene and Tropical Medicine, UK	210	8.206
Makere University, Uganda	167	6.526
University of Witswaterarand, RSA	154	6.018
University of Kwa-Zulu Natal, RSA	146	5.705
Stellenbosh University, RSA	109	4.259
South African Ministry of Health, RSA	106	4.142
Johns Hopkins University, USA	85	3.322
Harvard University, USA	83	3.243
University of California System, USA	75	2.931
World Health Organization (WHO)	68	2.657
University of Nigeria, FRN (tied with U of Western Cape)	58	2.267

Leading countries in research output “Health care sciences and services” 2004 - 2013

Country	Record (count)	% of total
South Africa	946	36.968
Uganda	299	11.684
Nigeria	251	9.809
Kenya	250	9.769
Tanzania	215	8.402
Ghana	131	5.119
Ethiopia	100	3.908
Zambia	90	3.517
Malawi	89	3.478
Burkina Faso	56	2.188
Zimbabwe	50	1.954
Source: Thompson Reuters Web of Science Database		

Transfer of technology – countries that collaborated most with Africa, in rank order 2004-2013

	Country	Number of papers	% of total
1	USA	748	29.23
2	England	472	18.445
3	Canada	163	6.37
4	Switzerland	124	4.846
5	Netherlands	96	3.751
6	Belgium	94	3.673
7	Australia	93	3.634
8	Norway	89	3.478
9	Sweden	85	3.322
10	France	72	2.814
11	Germany	66	2.579

Source: Thompson Reuters Web of Science Database

Summary of the evidence

- Africa's
  - Expenditure on health has been rising in absolute but has remained stable relative to GDP;
  - Of all regions of the world, spends the least on health relative to GDP;
  - import of health technologies has been rising but is less than 1% of GDP;
  - Health care system is low technology health care system;
  - health research publications have been rising as a share of global total;
  - Health research publications is accounted for mostly by foreign institutions;
- Most of the publications are in English – signifying a language divide between English and French (with serious implications for health);
- English-speaking foreign countries lead the transfer of health knowledge to Africa through research collaboration

New health technologies and the aspirations, pillars, and hopes

- Multi-port robotic surgery – guiding robotic arms into a patient's body through many tiny incisions in some cases, the size of a key-hole. This accelerates recovery time and reduces bleeding and scarring;
- Vaccines development (HIV; Ebola; Malaria to name a few);
- Telehealth/medicine – although cross-border expansion is constrained by licensure and credentialing;
- Data: Big data – particularly in the area of diagnosis. Open data in the area of transparency and accountability; mobile phone in the area of epidemiology.
- Point-of-care diagnostic technologies
- The internet of things;
- ICTs (smart phones, search engines, knowledge access)

Possible determinants of health technologies and innovations available for Agenda 2063 health agenda

- Prices charged for the technologies;
- African engineering manufacturing capacity;
- Rapid growth of a pluralistic health care market and including hospital market competition and consolidation;
- Widespread introduction of health insurance;
- The coverage, payment, and utilization management policies governing the use of health technologies:
- Demand - Differences in use by patients;
- Effect on health care budgets/spending;
- Financial barriers, - access to credit, national economic performance;
- Intellectual property rights regime and electronic fencing;
- Internationally agreed health goals under the UN SDG framework;
- Regional integration and regional health care markets.

Health technologies adoption policy rule:

- New Technologies and innovations in health can help Africa meet the health objectives of its transformation agenda. However:
  - Innovations in health should ensure that health care costs do not rise at such a rate as to introduce significant distortions and price the poor out of the healthcare market (This is the ADVANTAGE OF THE LATECOMER);
  - New health technologies adopted by state and private hospitals must bring benefits that justify the expenditure of scarce national resources on them.

Recommendations

- Countries must maintain sound economic policies (macro-micro);
- Strong technology and IPR policies:
  - Rigorous technology assessment to minimize the risk of “flat curve medicine”;
  - Technology transfer;
- Massive investment in higher education , in particular medical and health care related, and engineering: Africa has approximately 187 medical schools in 2014 concentrated in Sudan (28); Nigeria (26); Egypt (20); Algeria (12); Libya and South Africa (10 each); DRC (9); Ethiopia (8);
- Pursue regional integration since knowledge and infectious disease prevention/eradication/containment is a public good;
- Regulatory reforms

Conclusion: Possible risks/threats to success

- Aid. New health technologies and innovations will in large measure be determined by the emphasis that donors place on diseases. Example – focus on HIV/AIDS; data and performance metrics driven by the Bill and Melinda Gates Foundation;
- Weak manufacturing sector – Africa will not be able to manufacture the medical technology that it needs;
- Language and knowledge-intensity of new health technologies could result in significant and costly sub-optimal use and health outcome differences by language groupings;
- Resistance from physicians and health care specialists – threats to their jobs;
- Funding (economics), leadership, political will.

THANK YOU

Note on data

- Data on trade come from the UNCTAD Trade database;
- Data on research output and publications come from the Thompson – Reuters World of Science database.
- Agenda 2063, Common African Position on the post-2015 Agenda, and the Science, Technology and Innovation Strategy for Africa -2024 (STISA -2024) are available on the AUC website.