

China, India and personalised medicine

Stuart Hogarth, Department of Social
Science, Health and Medicine,
King's College London

Overview

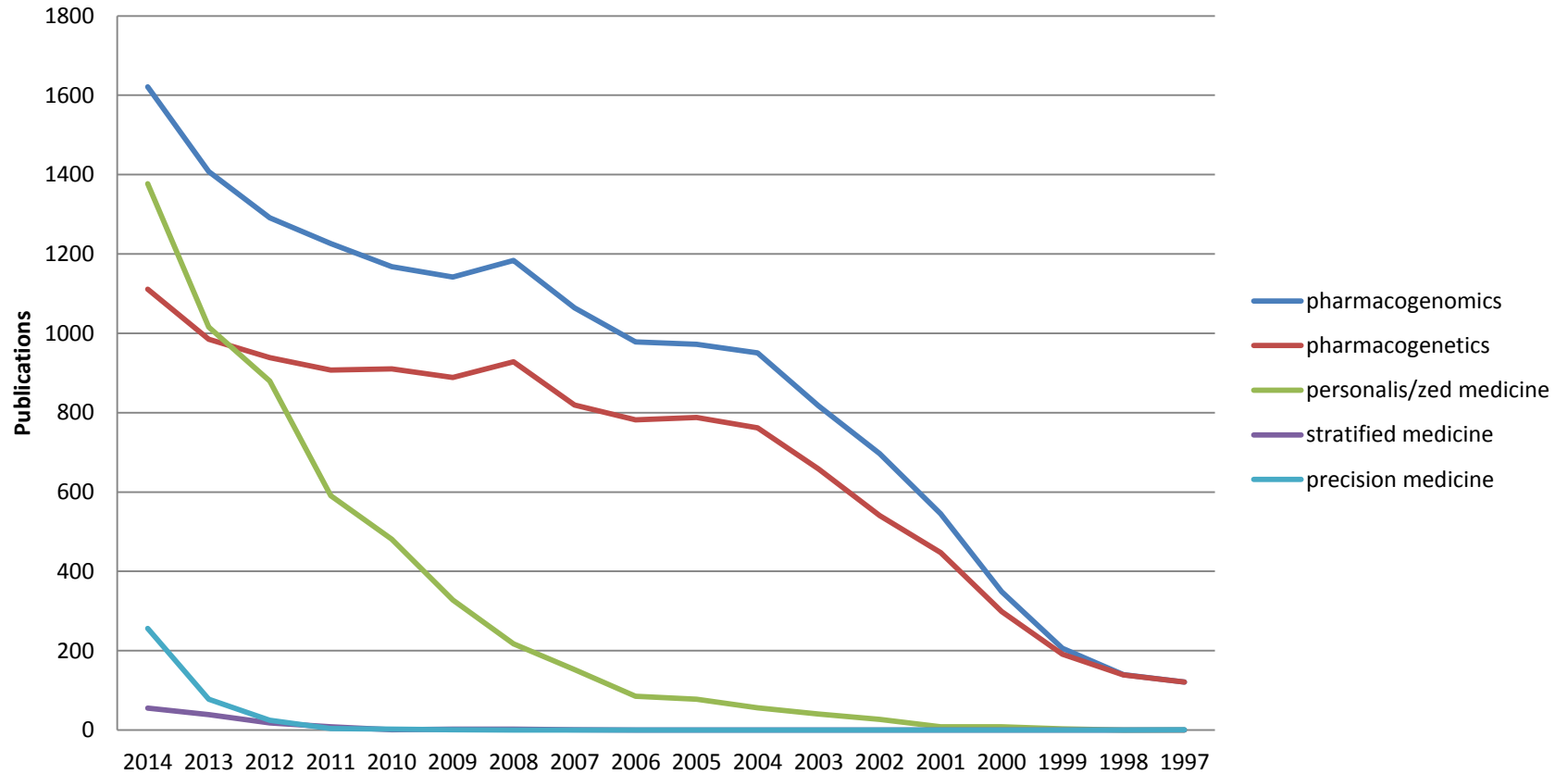
- Governing biomedical innovation
- The evolving personalised medicine landscape
- Governance challenges: India and China
 - Targeted therapeutics and companion diagnostics
 - Early detection/screening

What's in a name?

- Personalised medicine
- Stratified medicine
- Precision medicine
- P4 medicine

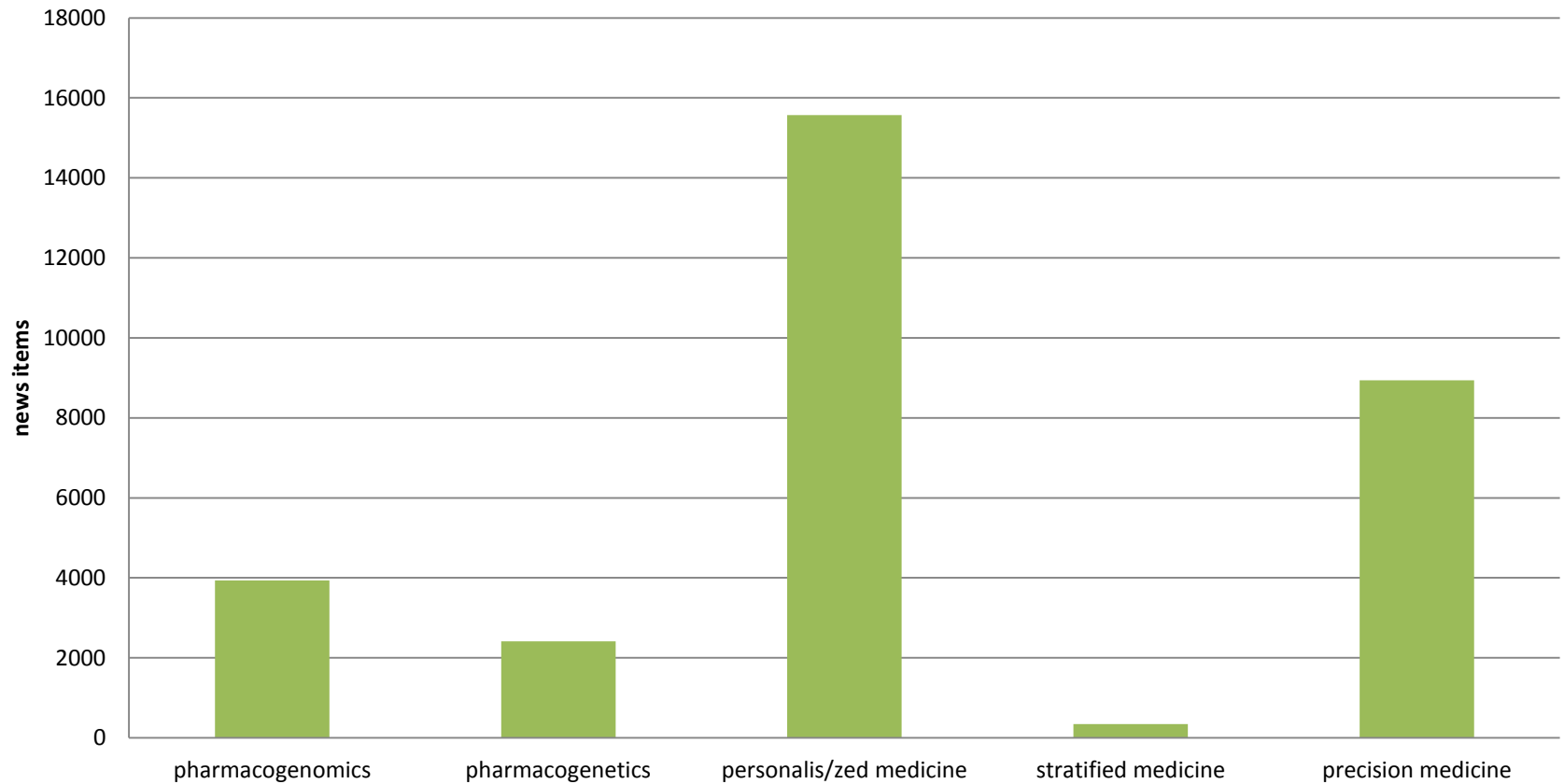
What's in a name

Changing terminology



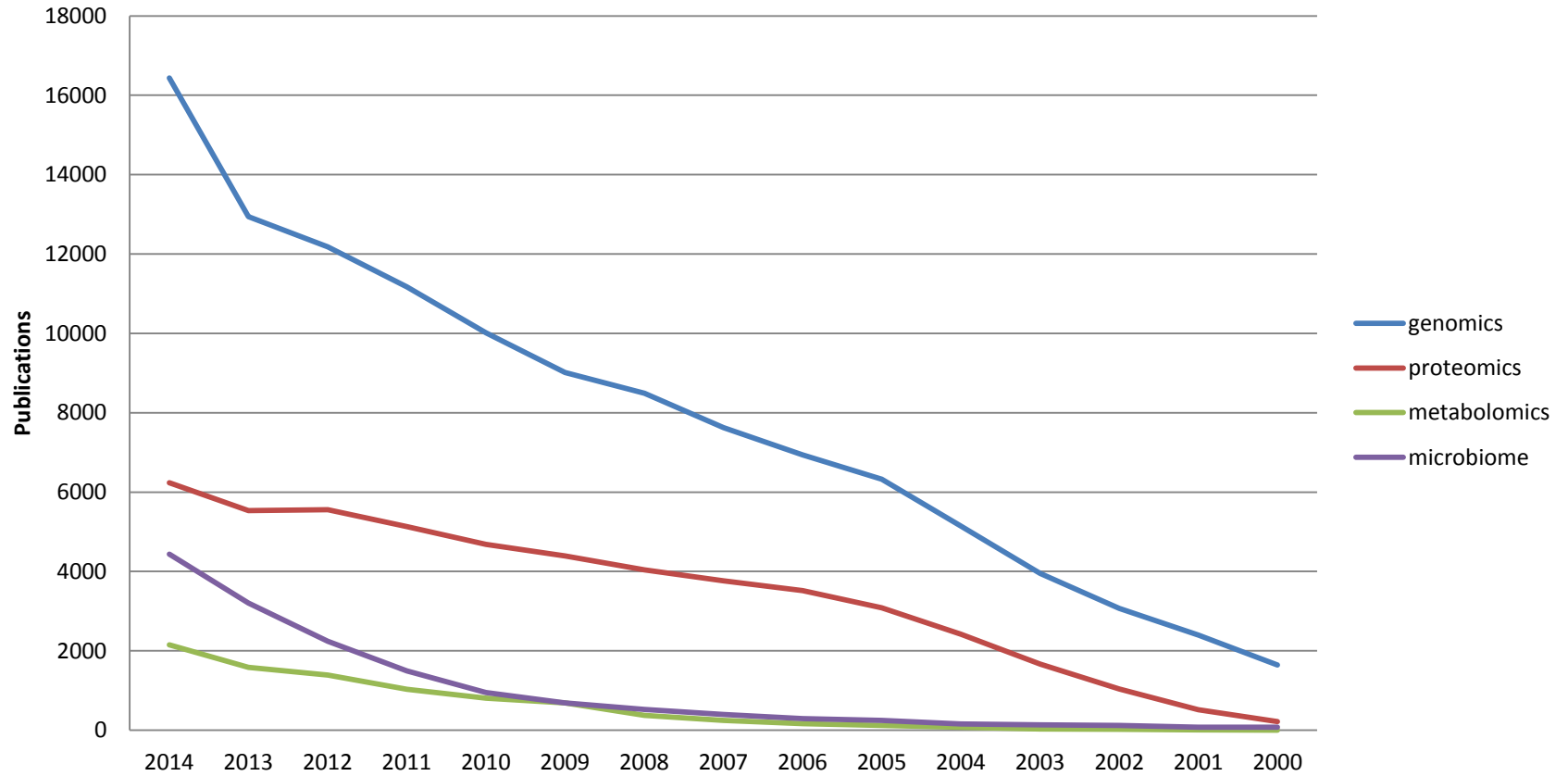
What's in a name?

News coverage Aug 2013- Aug 2015



Which 'omics?

Growth in 'omics research 2000-2014



Genomic determinism

- Cheaper, faster sequencing critical goal
- Will inevitably lead to a revolution in medicine
- One model of implementation – universal incorporation of genome sequence in medical record

illumina®



Technological trajectories

- High throughput
 - Next generation sequencing
 - Microarrays
- Automation
 - sample to results
 - deskilling
 - cost reduction
 - POC

Point of Care DNA Dx

QuantuMDx

QuantuMDx - Changing healthcare, Globally

Q-POC™ - analysing DNA in under 15 minutes.

The smartphone-like device will provide the accuracy, sensitivity and specificity of a state of the art laboratory, at the patient's side and at a fraction of the cost.



Targeted Rx + companion Dx

1998 - FDA approval of Herceptin and HercepTest for breast cancer patients with HER2+ tumors



FDA approved Rx with companion Dx

Non-small cell lung cancer

Iressa (gefitinib)

Xalkori (crizotinib)

Gilotrif (afatinib)

Tarceva (erlotinib)

Colorectal cancer

Erbitux (cetuximab)

Vectibix (panitumumab)

Ovarian cancer

Lynparza (olaparib)

Gastrointestinal stromal tumors

Gleevec/Glivec (imatinib mesylate)

Breast cancer

Herceptin (trastuzumab)

Perjeta (pertuzumab);

Kadcyla

(ado-trastuzumab

emtansine)

Melanoma

Mekinist (tramatenib);

Tafinlar (dabrafenib)

Zelboraf

Cystic Fibrosis

Kalydeco

(ivacaftor)

Thalassemia

Exjade

(deferasirox)



RESEARCH

Understanding the molecular
basis of life



CLINICAL

Bringing molecular insights to
medicine



Test Menu

Cardiology

Oncology

Reproductive

Endocrine

A combination of tests that will help in the selecting the targeted therapy in colorectal cancers. The tests will also elevate the hereditary disposition to colorectal cancers.



cervi CORE
colo CORE
gastri CORE
hema CORE
mamma CORE
neuro CORE
ova CORE
pulmo CORE
uro CORE



colo CORE I

KRAS
BRAF
EGFR
N RAS

colo CORE II

MMR Proteins
p21
p27
p53

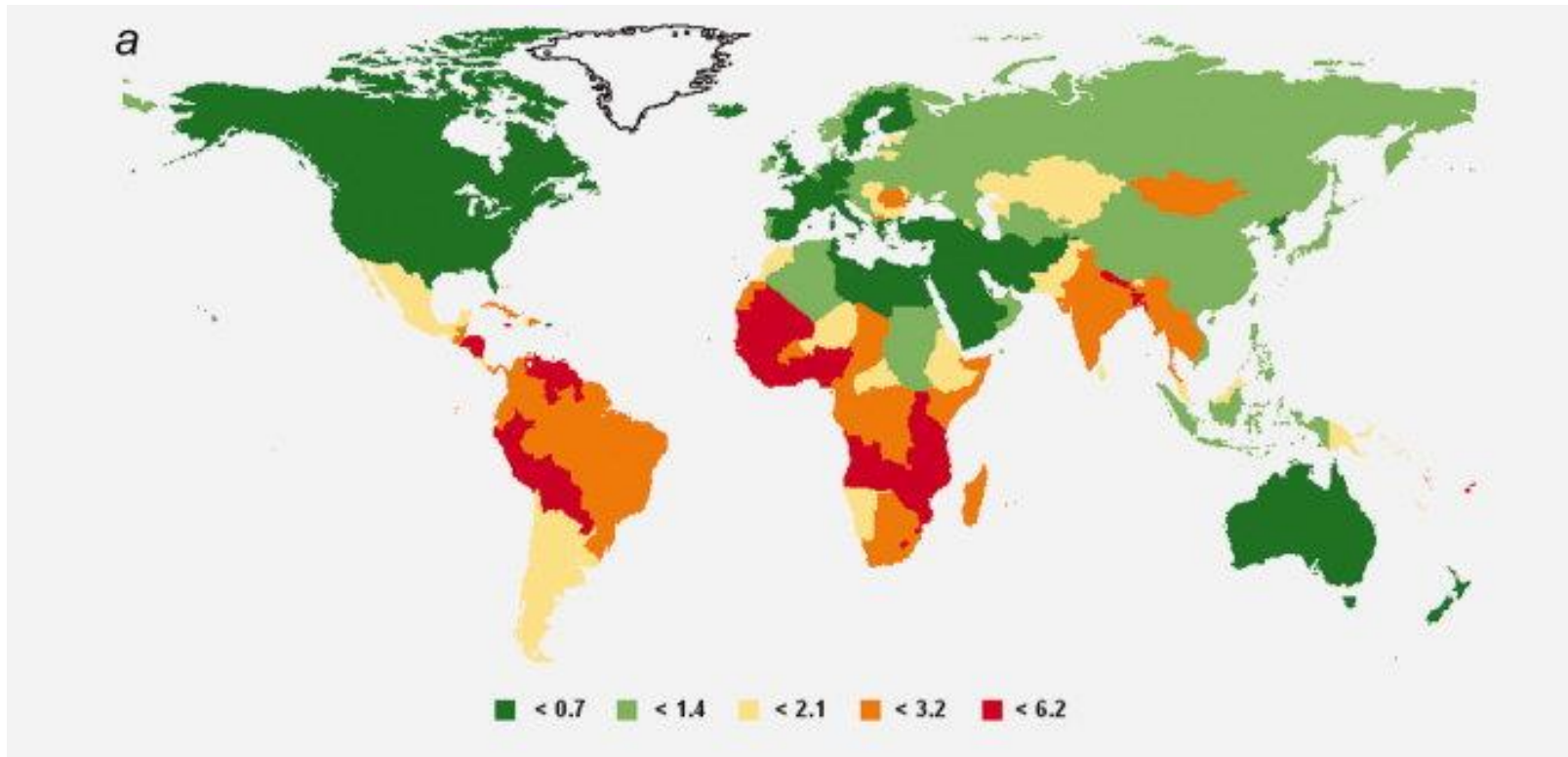
Access issues

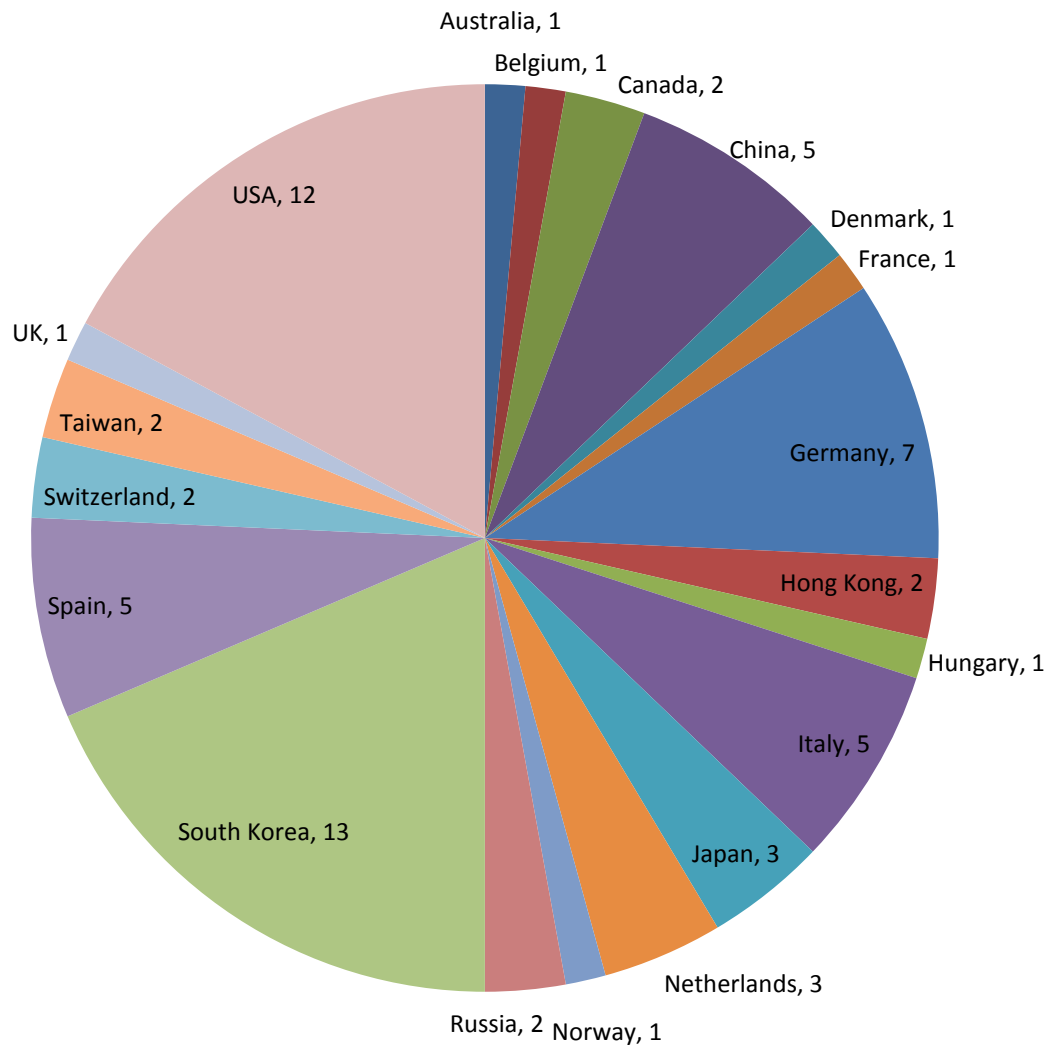
... an estimated 441 patients were eligible to receive HER2-targeted therapy in the year 2008 in our institution. However, only 8.61% of these patients were able to receive such treatment and nearly half (4.54%) of the HER2-targeted therapy was through patient participation in clinical trials. The low usage of a highly effective treatment is ascribed to the financial constraints that are common in our patients and a healthcare delivery model wherein the majority of patients have no access to any form of health insurance.

Ghosh et al Ind Jnl Cancer, 2011



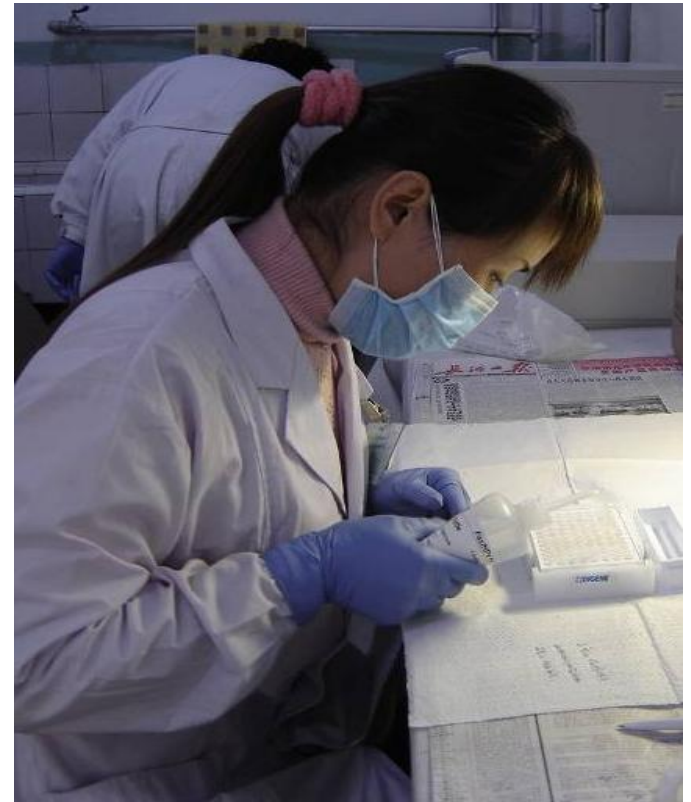
GLOBOCAN estimates of worldwide burden of cervical cancer 2008





careHPV

- 2003 - Digene partner with PATH and Bill & Melinda Gates Foundation on test for LMIC
- 2012 – SFDA approve *careHPV* test for use in China
 - Stable at extreme temperatures
 - Simple robust procedure
 - Works in low-resource setting
 - Low cost



The broader medtech market

News Feature | April 13, 2015



India Plans Medtech Industrial Parks To Boost Local Device Manufacturing

By Jof Enriquez

The government of India recently announced plans to build the country's first industrial parks dedicated to medical device manufacturing. The first such medtech park is planned to be constructed in Gujarat, while the second one is planned for Chengalpattu in Tamil Nadu.

"We have spoken to the Gujarat Chief Minister already on this and the state based National Institute of Pharmaceutical Education and Research will be the nodal institute to supervise it," said Ananth Kumar, union minister of chemicals and fertilizers, in a recent report from the *Economic Times*. "We have also spoken to the finance minister and revenue secretary to firm up the incentive structure that can be provided for the same."

Kumar's remarks came as he announced a government report on boosting the domestic production of high-end medical devices to counter the dominance of imports.



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