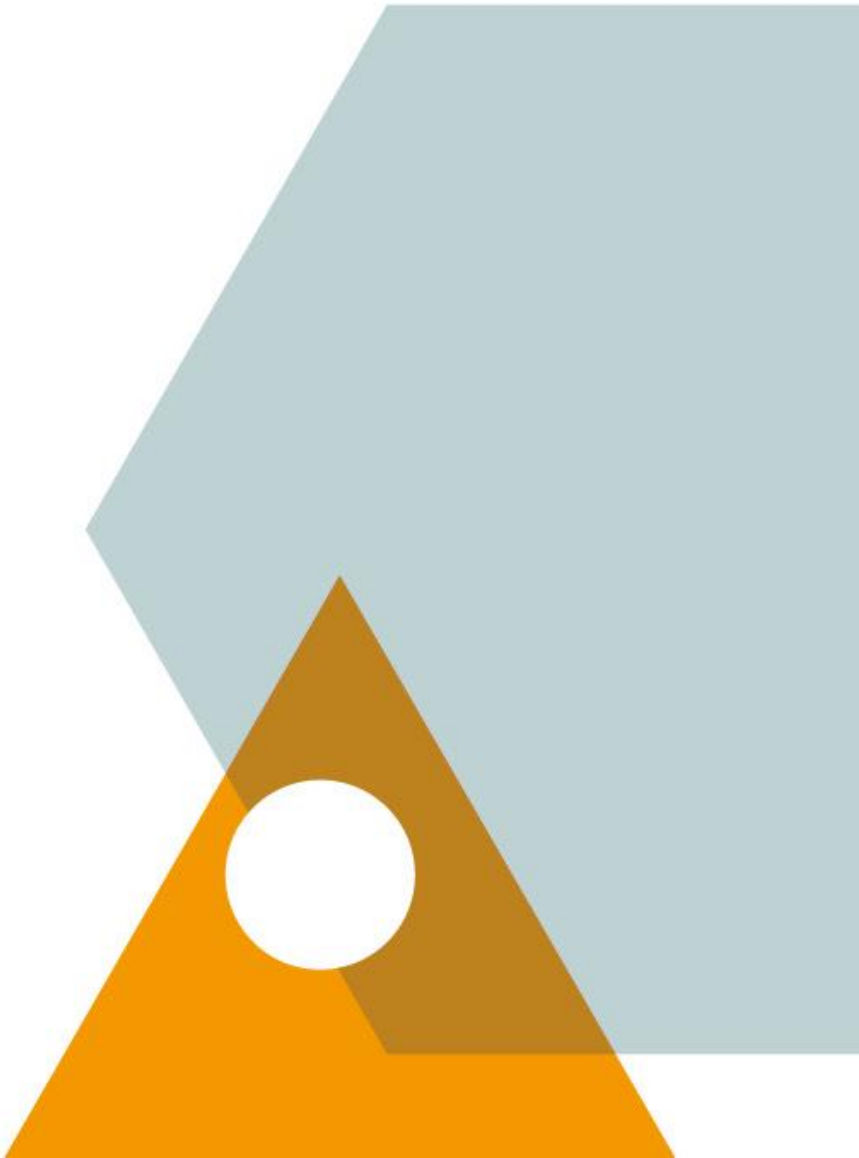
ESTRO

European SocieTy for
Radiotherapy & Oncology



What is the average life expectancy at birth in the world today?

A ☐ 50 years

B ☐ 60 years

C ☐ 70 years

CORRECT ANSWER

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There has been a 10-year rise in life expectancy over the past five decades, thanks to great advances in healthcare across the world.

Source: http://esa.un.org/unpd/wpp/unpp/panel_indicators.htm

What percentage of cancer patients requires radiotherapy across the globe?

A ☐ 30 %

B ☐ 50 %

C ☐ 70 %

CORRECT ANSWER

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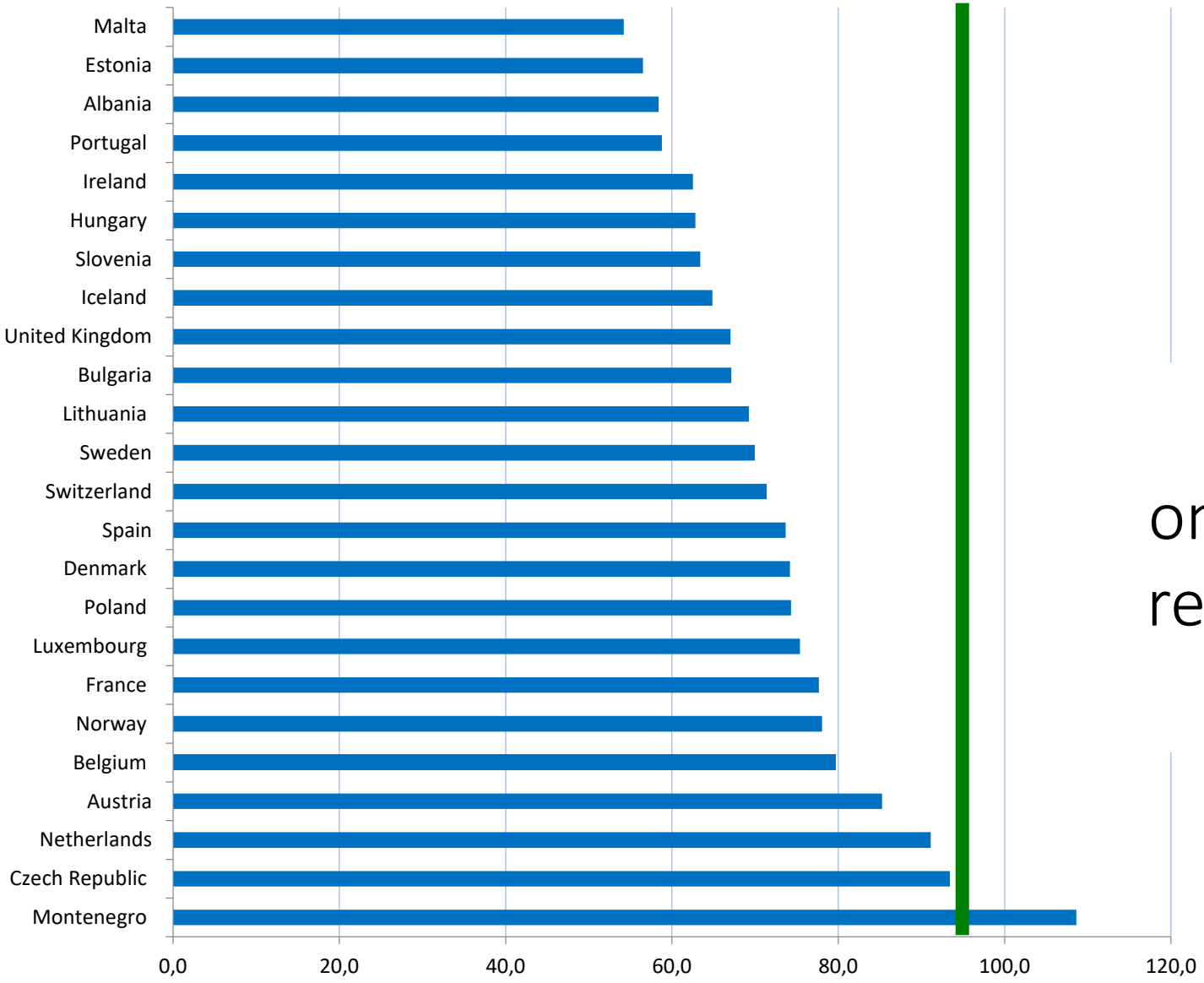
C ☐ 70 %

Of all patients diagnosed with cancer, roughly 50% have an indication for external beam radiotherapy at least once, at some time, during the course of their illness.

2012 → 2035

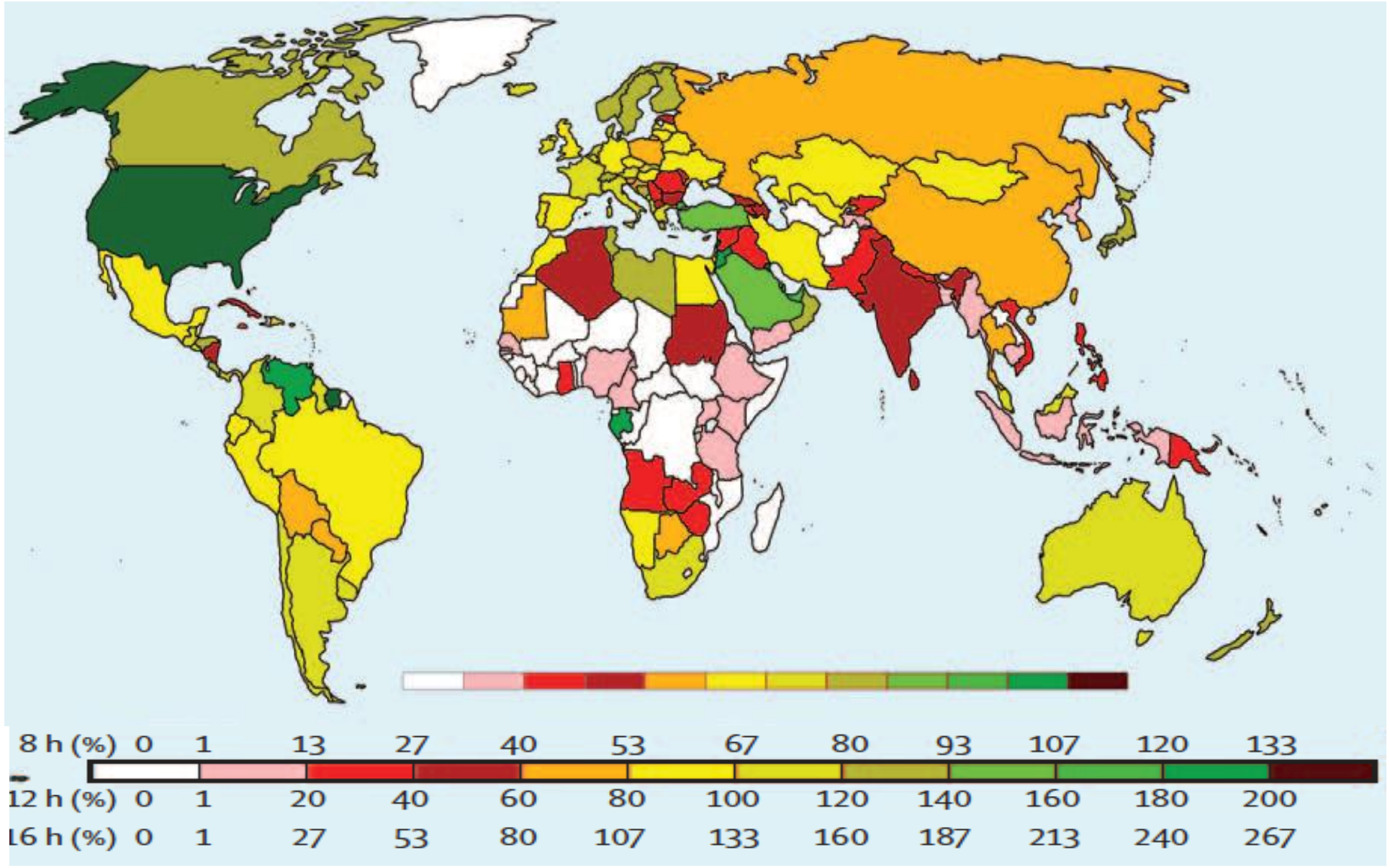
cancer incidence: 14 → 24 million

cancer deaths: 8 → 14.5 million



in Europe,
only 7 out of 10 patients
receive the radiotherapy
they need

Borras et al, Radiother Oncol 2015



available resources vs. resources needed

Atun et al, Lancet Oncology 2015

Expanding global access to radiotherapy

Rifat Atun, David A Jaffray, Michael B Barton, Freddie Bray, Michael Baumann, Bhadrasain Vikram, Timothy P Hanna, Felicia M Knaul, Yolande Lievens, Tracey Y M Lui, Michael Milosevic, Brian O'Sullivan, Danielle L Rodin, Eduardo Rosenblatt, Jacob Van Dyk, Mei Ling Yap, Eduardo Zubizarreta, Mary Gospodarowicz

Radiotherapy is a critical and inseparable component of comprehensive cancer treatment and care. For many of the most common cancers in low-income and middle-income countries, radiotherapy is essential for effective treatment. In high-income countries, radiotherapy is used in more than half of all cases of cancer to cure localised disease, palliate symptoms, and control disease in incurable cancers. Yet, in planning and building treatment capacity for cancer, radiotherapy is frequently the last resource to be considered. Consequently, worldwide access to radiotherapy is unacceptably low. We present a new body of evidence that quantifies the worldwide coverage of radiotherapy services by country. We show the shortfall in access to radiotherapy by country and globally for 2015–35 based on current and projected need, and show substantial health and economic benefits to investing in radiotherapy. The cost of scaling up radiotherapy in the nominal model in 2015–35 is US$26·6 billion in low-income countries, $62·6 billion in lower-middle-income countries, and $94·8 billion in upper-middle-income countries, which amounts to $184·0 billion across all low-income and middle-income countries. In the efficiency model the costs were lower: $14·1 billion in low-income, $33·3 billion in lower-middle-income, and $49·4 billion in upper-middle-income countries—a total of $96·8 billion. Scale-up of radiotherapy capacity in 2015–35 from current levels could lead to saving of 26·9 million life-years in low-income and middle-income countries over the lifetime of the patients who received treatment. The economic benefits of investment in radiotherapy are very substantial. Using the nominal cost model could produce a net benefit of $278·1 billion in 2015–35 ($265·2 million in low-income countries, $38·5 billion in lower-middle-income countries, and $239·3 billion in upper-middle-income countries). Investment in the efficiency model would produce in the same period an even greater total benefit of $365·4 billion ($12·8 billion in low-income countries, $67·7 billion in lower-middle-income countries, and $284·7 billion in upper-middle-income countries). The returns, by the human-capital approach, are projected to be less with the nominal cost model, amounting to $16·9 billion in 2015–35 (–$14·9 billion in low-income countries; –$18·7 billion in lower-middle-income countries, and $50·5 billion in upper-middle-income countries). The returns with the efficiency model were projected to be greater, however, amounting to $104·2 billion (–$2·4 billion in low-income countries, $10·7 billion in lower-middle-income countries, and $95·9 billion in upper-middle-income countries). Our results provide compelling evidence that investment in radiotherapy not only enables treatment of large numbers of cancer cases to save lives, but also brings positive economic benefits.

Lancet Oncol 2015; 16: 1153–86

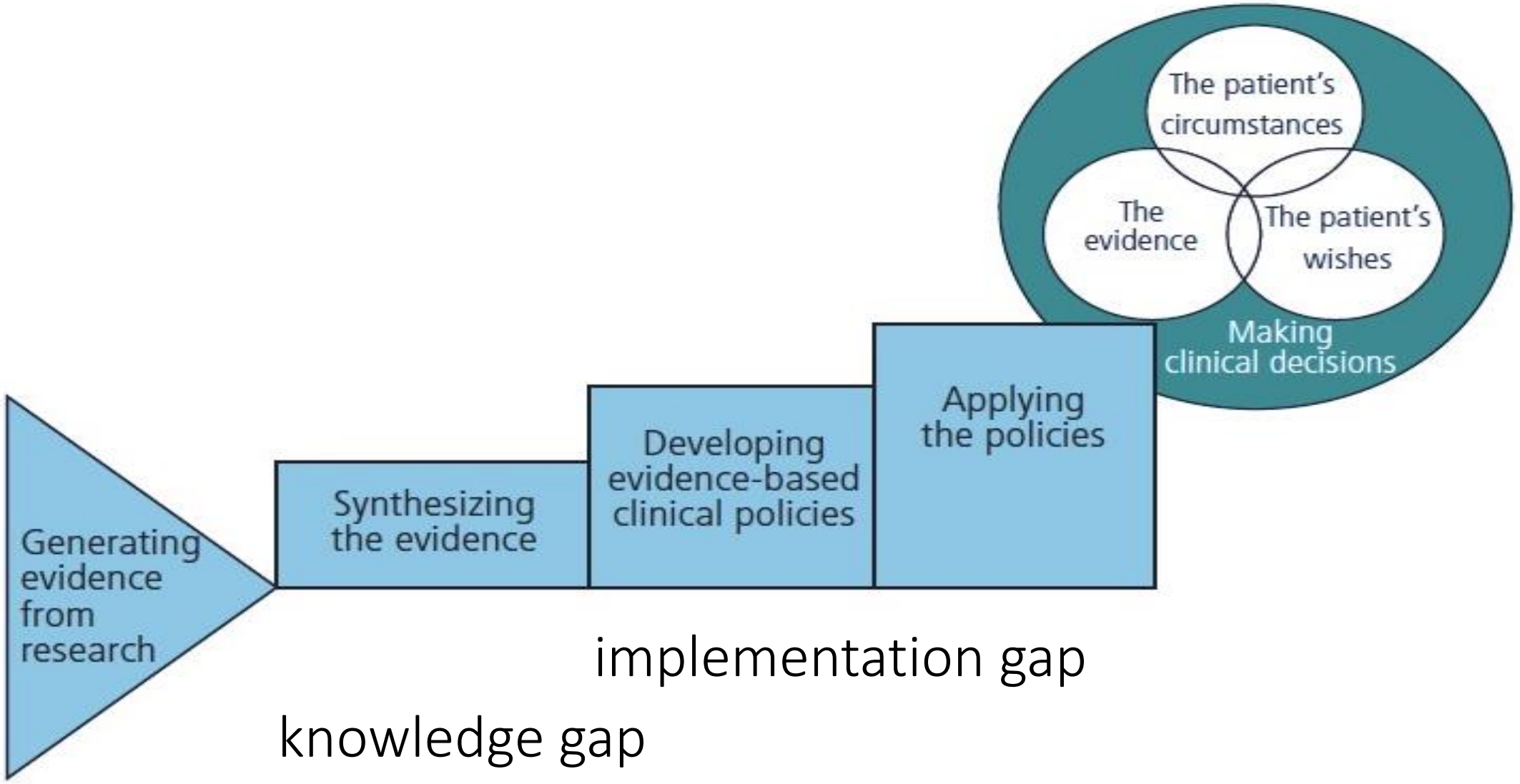
See Comment pages 1143–52

Harvard TH Chan School of Public Health (Prof R Atun MD), **Harvard Global Equity Initiative** (F M Knaul PhD), **and Harvard Medical School** (F M Knaul), **Harvard University, Cambridge, MA, USA; Princess Margaret Cancer Centre, Toronto, ON, Canada** (Prof D A Jaffray PhD, Prof M Milosevic MD, Prof B O'Sullivan MD, Prof M Gospodarowicz MD); **TECHNA Institute, University Health Network, Toronto, ON, Canada** (Prof D A Jaffray, T Y M Lui MSc); **Department of Radiation Oncology, University of Toronto, Toronto, ON, Canada** (Prof D A Jaffray, Prof B O'Sullivan, D L Rodin MD, Prof M Gospodarowicz); **Ingham Institute for Applied Medical Research, University of New South Wales, Liverpool, NSW, Australia** (Prof M B Barton MBBS, T P Hanna MD, M L Yap MD); **International Agency for Research on Cancer, Lyon, France** (F Bray PhD); **Department of Radiation Oncology, Medical Faculty and University Hospital Carl Gustav Carus, Technische Universität Dresden, Dresden, Germany** (Prof M Baumann MD); **National**

Introduction

In 2012, 14·1 million new cases of cancer were reported worldwide (figure 1A), and this number is projected to lacking access to radiotherapy.[7] The growing burden of cancer will place increased demand on the already-scarce radiotherapy services worldwide.

- 40-60% of eligible patients (12M) have access to RT
- Total number of new patients per year: raising from 15 to 22 M in 2022
- 1 Million lives can be saved per year by 2035. Over 230k in Europe, today.

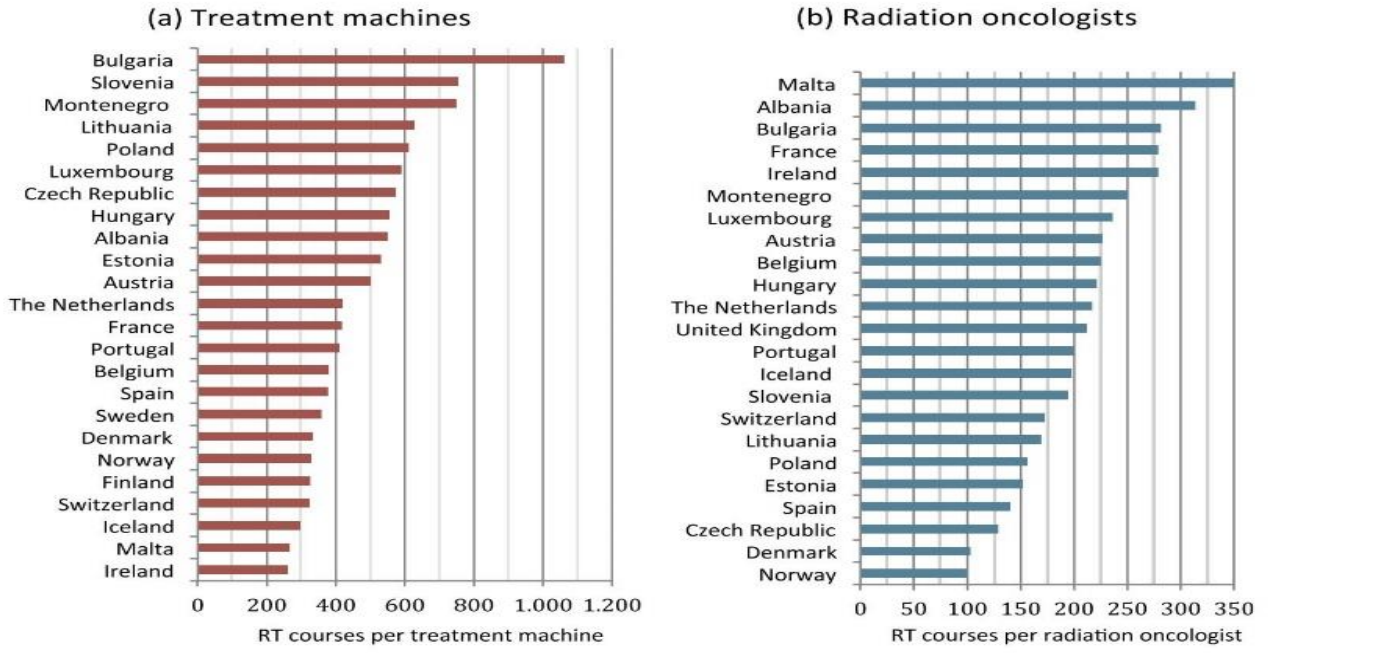


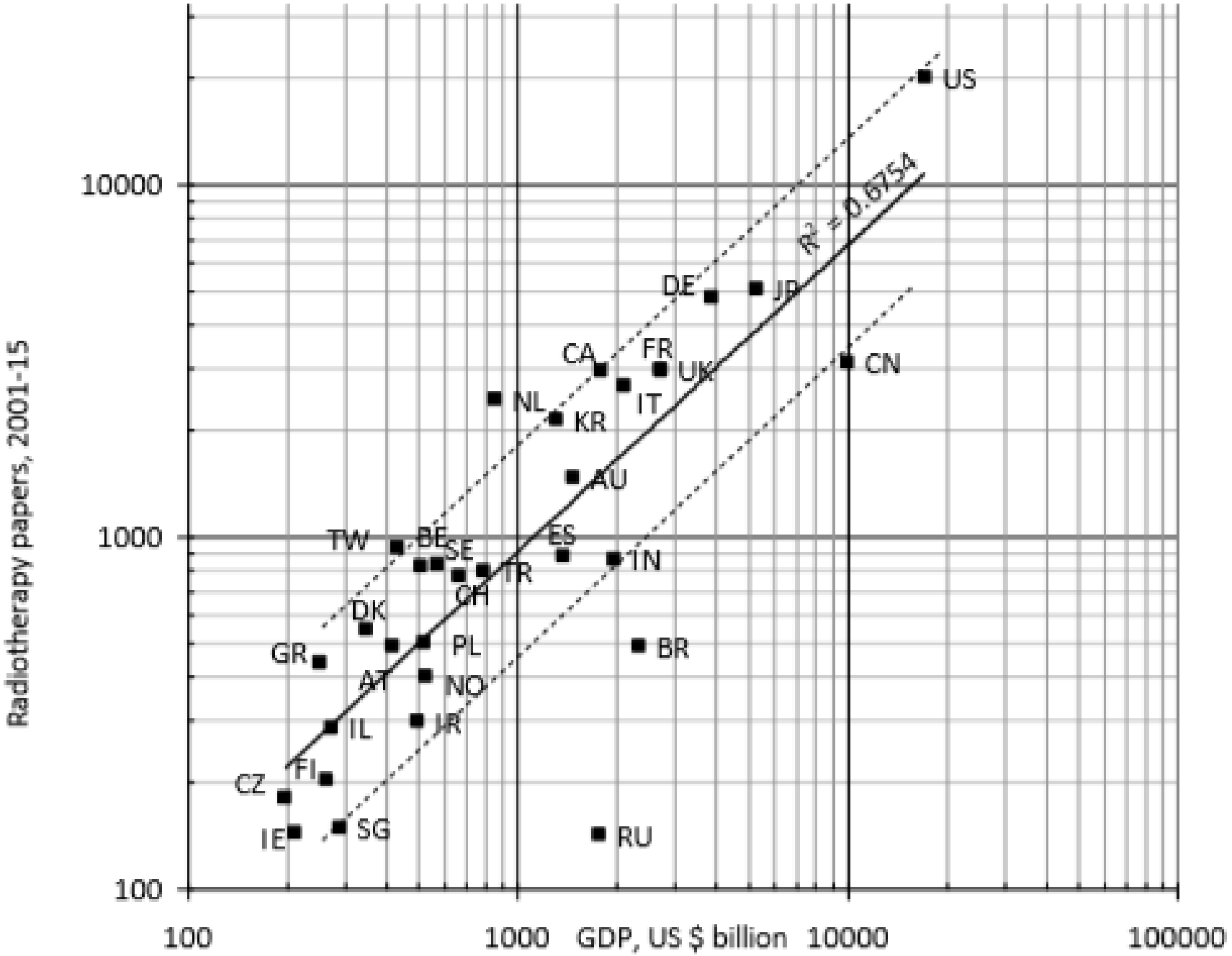
implementation gap

knowledge gap

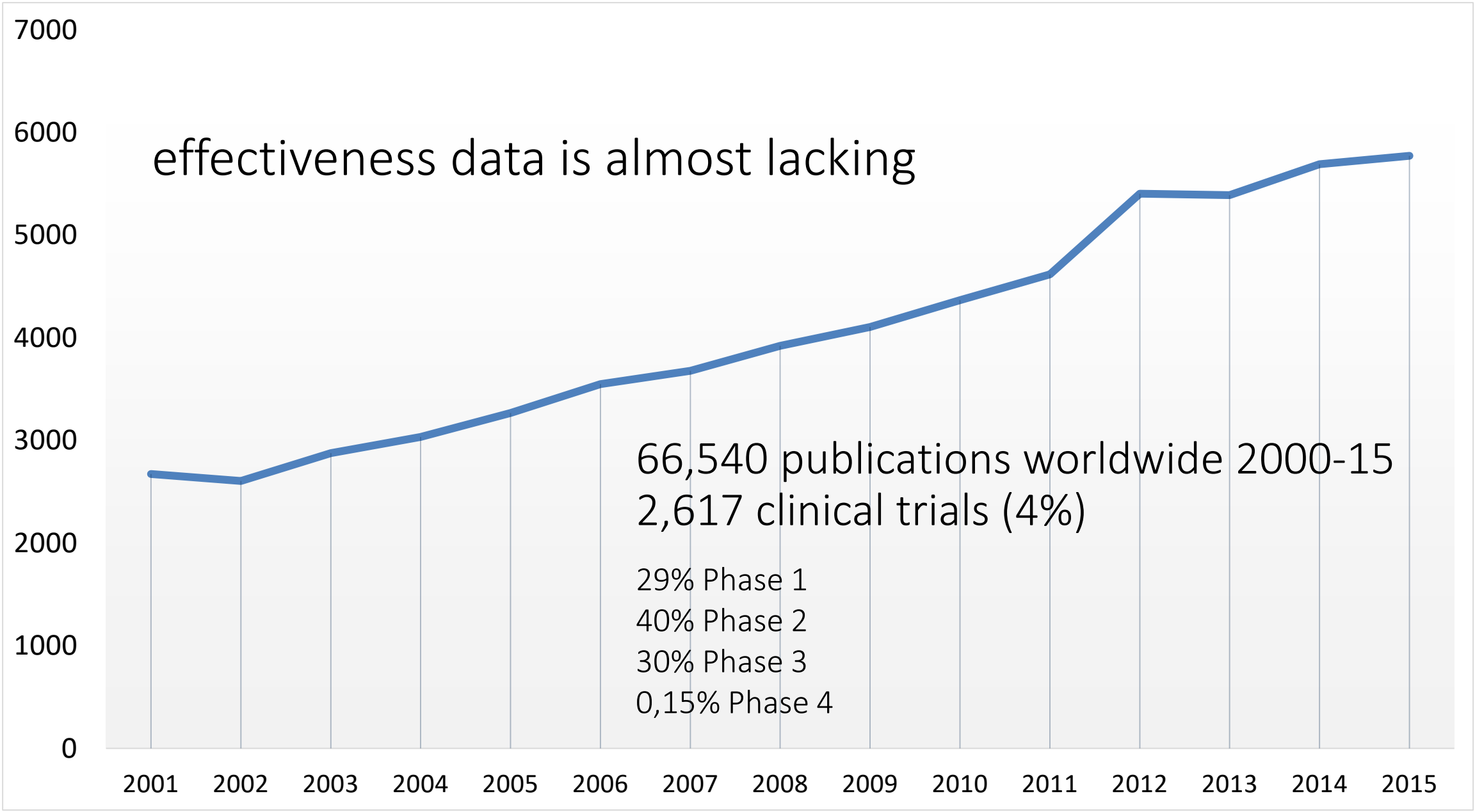
research gap

Haines et al, Bulletin of the World Health Organization, 2004


(a) Treatment machines
Bulgaria
Slovenia
Montenegro
Lithuania
Poland
Luxembourg
Czech Republic
Hungary
Albania
Estonia
Austria
The Netherlands
France
Portugal
Belgium
Spain
Sweden
Denmark
Norway
Finland
Switzerland
Iceland
Malta
Ireland
0 200 400 600 800 1.000 1.200
RT courses per treatment machine
Mean:483 Median:419 Min:262 Max:1,061
(b) Radiation oncologists
Malta
Albania
Bulgaria
France
Ireland
Montenegro
Luxembourg
Austria
Belgium
Hungary
The Netherlands
United Kingdom
Portugal
Iceland
Slovenia
Switzerland
Lithuania
Poland
Estonia
Spain
Czech Republic
Denmark
Norway
0 50 100 150 200 250 300 350
RT courses per radiation oncologist
Mean:208.9 Median212.1 Min:99.9 Max:348.8
(c) Medical physicists and dosimetrists
Poland
Bulgaria
Czech Republic
Austria
The Netherlands
Malta
Albania
Hungary
Norway
Slovenia
France
Switzerland
Belgium
Denmark
Estonia
Spain
Lithuania
Luxembourg
Portugal
Ireland
United Kingdom
Iceland
Montenegro
0 100 200 300 400 500 600 700 800
RT courses per MP / dosimetrist
Mean:303.3 Median:213.1 Min:85.0 Max:757.7
(d) RTTs and nurses
Albania
Malta
Czech Republic
Montenegro
Estonia
Hungary
France
Poland
Lithuania
Slovenia
Luxembourg
Austria
Belgium
Bulgaria
Iceland
Portugal
Norway
United Kingdom
Switzerland
Denmark
The Netherlands
Ireland
Spain
0 50 100 150
RT courses per RTT / nurse
Mean:76.8 Median:72.6 Min:25.7 Max:156.8



Aggarwal et al, IJROBP 2018



Aggarwal et al, IJROBP 2018

THE PARADOX

*"Scientific developments have spurred unprecedented **'delivery of innovations'** for new medicines and medical devices, but **'innovation in delivery'** has faltered."*

FINANCIAL TIMES

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Special Report: Innovation in Healthcare

Comment: It is time to transform healthcare delivery

Cost rises put sustainability at risk, says Prof Rifat Atun of Harvard University

0 Save

NOVEMBER 29, 2016 by: Rifat Atun

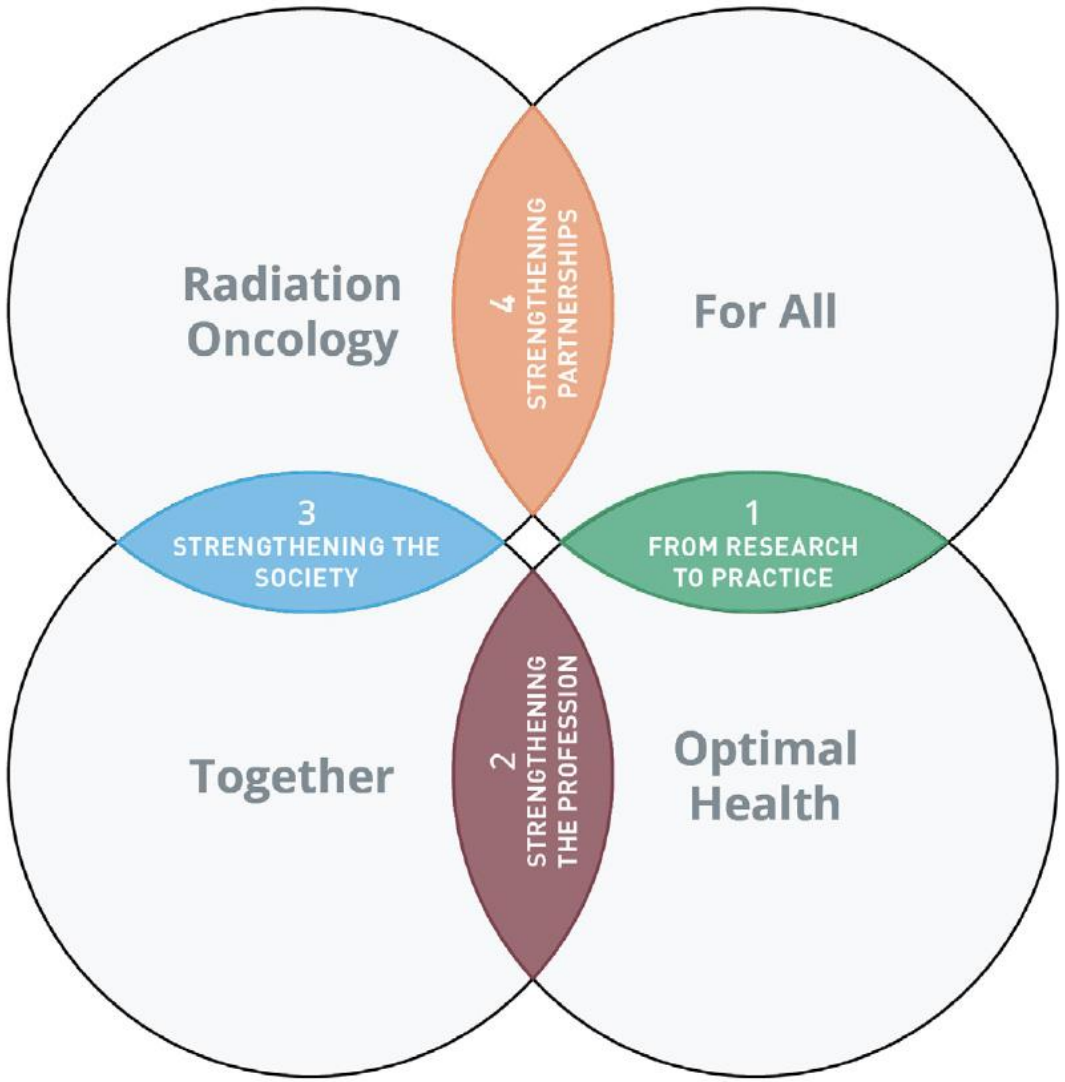
Transformative innovation in healthcare delivery is critical for sustainability of health systems worldwide. They face a potentially crippling rise in health risks, chronic illness and disability, as well as higher citizens' expectations of better healthcare and access to innovative medicines and medical devices. With real growth in health expenditures far outstripping GDP growth and fiscal constraints, risks to sustainability are real.

Rifat Atun, Keynote Lecture ESTRO 37

Value-Based Health Care

$$\text{Value} = \frac{\text{Health outcomes that matter to } \mathbf{patients}}{\text{Costs of delivering these outcomes}}$$

Porter M. N Engl J Med 2010



Radiation Oncology.
Optimal Health
Together. **FOR ALL,**

- ESTRO VISION 2030 -

Lievens et al, Radiotherapy & Oncology, 2019