RADIO NEWS

REG. U.S. PAT. OFF.

25 Cents
April
1924
Over 200 Illustrations

Edited by H. GERNSBACK

THE RADIO DOCTOR — *Maybe!*

See Page 1406

IN THIS ISSUE:
Sir Oliver Lodge, F.R.S.
Dr. J. A. Fleming, F.R.S.
F. W. Dunmore and
F. H. Engel of
Bureau of Standards
Howard S. Pyle
Brainard Foote

THE 100% RADIO MAGAZINE

CIRCULATION LARGER THAN ANY OTHER RADIO PUBLICATION

Хуго
Гернзбак
(1884-1967)

1925

Portable Electrocardiograph

THE portable electrocardiograph recently demonstrated by the general engineering laboratory of the General Electric Co. is illustrated on this page. One of these devices could be used by the country physician in submitting a diagnosis by radio, in accordance with the apparatus depicted on the left hand page. The entire device weighs only 37 pounds and the power unit weighs 33 pounds. The apparatus open is shown at the right.
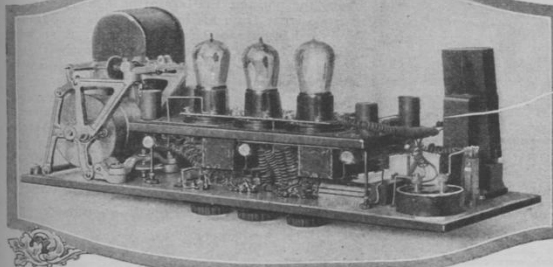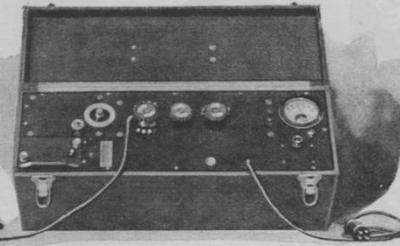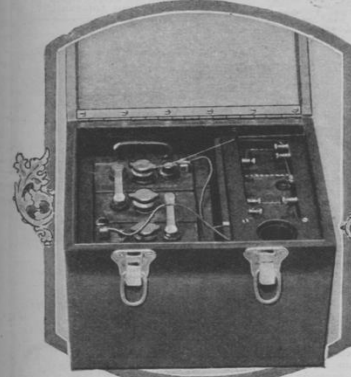
The photo above shows the portable electrocardiograph with the panel board inverted showing the vacuum tubes. In the old style cardiograph elaborate protection against vibration had to be made. Usually vibration-proof foundations were used for the mountings of these instruments. The fragile metal quartz thread used in the former apparatus is dispensed with in this construction.

Contraction of the heart muscles is accompanied by or preceded by an electrical manifestation. This electrical change is amplified by vacuum tubes. The voltage before and after the heart beat is in the neighborhood of one one thousandth of a volt.

A patient having a cardiogram made is depicted in the above photo. Simple metal electrodes fastened to the arms and legs of the patient are used in place of the wet sponge electrodes formerly employed. The functioning of this instrument is not affected by skin resistance. The results could be transmitted by radio to a consulting physician, telephotographically.

Lead I

W.J.H.
Lead II

W.J.H.
Lead III

The power unit for the electrocardiograph is illustrated above. At the right are three typical cardiograms used for diagnosing different kinds of heart trouble taken with three different leads. They are caused by a spot of light acting on a moving film strip.
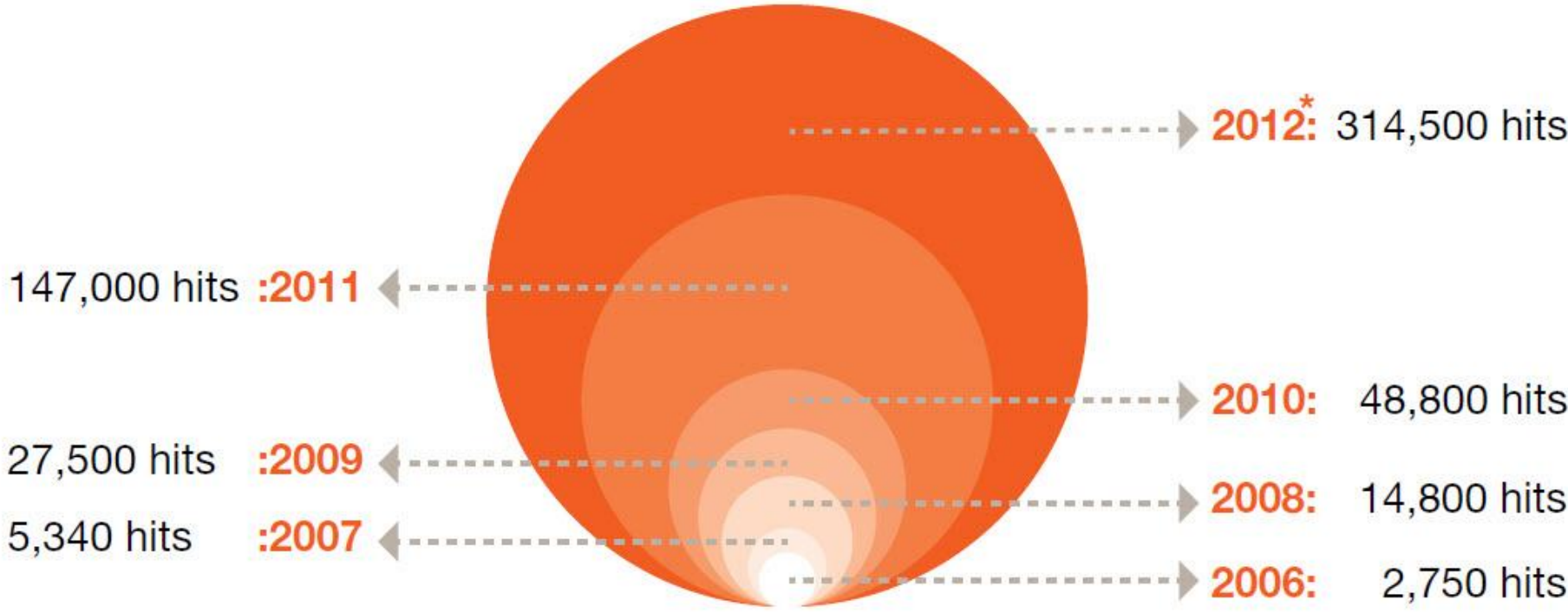
Garry Shannon, 2006
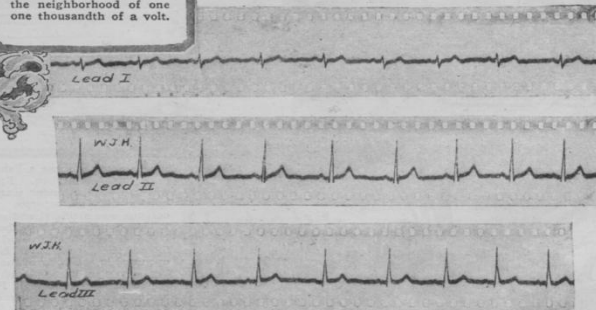
Рисунок 23.
Профессор Г.Гвида
проводит радио-
телеконсультацию
для заболевшего
моряка (1935 г.) [74]

Vision

•**Present state:** Chronic diseases are episodically diagnosed and intermittently treated, consuming enormous resources driven by exacerbations, clinical decompensations, and complications.

•**Future state:** Chronic diseases will be met with continuous care, improving outcomes and lowering costs by prediction and prevention of acute presentations.

•**Path:** Skin-surface or implanted sensor technology, providing actionable diagnostic information, linked to learning systems and titratable therapies, enabling continuously-tailored (feedback-controlled) treatment.

Chart 1: New mHealth Google hits in year

2012*: 314,500 hits

147,000 hits :2011

2010: 48,800 hits

27,500 hits :2009

2008: 14,800 hits

5,340 hits :2007

2006: 2,750 hits

*Estimate for all of 2012 taken by multiplying pre-March 27 figure by 5

Online access is high with **79%** of the UK population now using the internet anywhere, up from **59%** in 2005[5]

59%

2005

79%

2012

NHS - Digital First-The delivery choice for England's population, 2012

92% of the population (70% for aged 65 or over) have a mobile phone, with 45% possessing a smartphone[6]
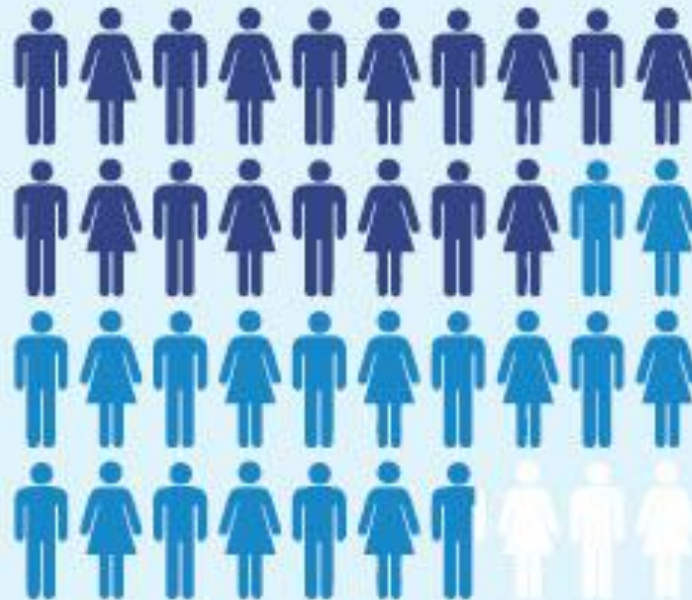
Have a mobile phone   Have a smartphone

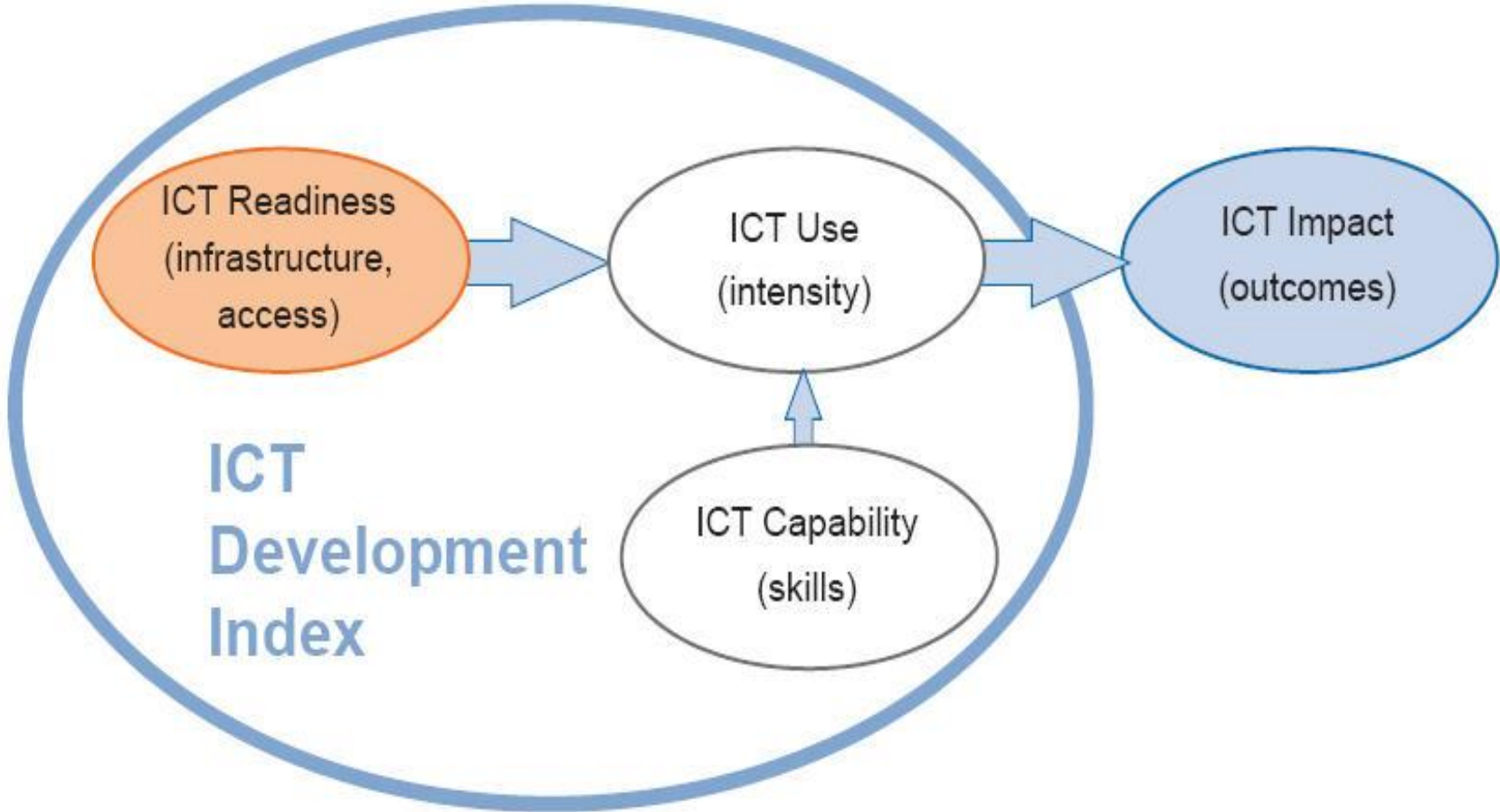**NHS - Digital First-The delivery choice for England's population, 2012**

http://www.itu.int/ITU-
D/ict/publications/idi/2009/index.html

Figure 3.1: Three stages in the evolution towards an information society

Уровень развития IT в странах мира

Economy	Rank 2007	IDI 2007	Rank 2002	IDI 2002
Sweden	1	7.50	1	6.05
Korea (Rep.)	2	7.26	3	5.83
Denmark	3	7.22	4	5.78
Netherlands	4	7.14	6	5.43
Iceland	5	7.14	2	5.88
Norway	6	7.09	5	5.64
Luxembourg	7	7.03	21	4.62
Switzerland	8	6.94	7	5.42
Finland	9	6.79	8	5.38
United Kingdom	10	6.78	10	5.27
Hong Kong, China	11	6.70	12	5.10
Japan	12	6.64	18	4.82
Germany	13	6.61	14	5.02
Australia	14	6.58	13	5.02
Singapore	15	6.57	16	4.83
New Zealand	16	6.44	19	4.79
United States	17	6.44	11	5.25
Ireland	18	6.37	26	4.36
Canada	19	6.34	9	5.33
Austria	20	6.32	20	4.64
Chile	48	4.00	45	2.97
Uruguay	49	3.88	46	2.90
Russia	50	3.83	52	2.71
Ukraine	51	3.80	59	2.50
Malaysia	52	3.79	50	2.74
Jamaica	53	3.78	48	2.79

Chart 21: mHealth adoption may reflect relative need

Doctors per 1,000 population in 2012
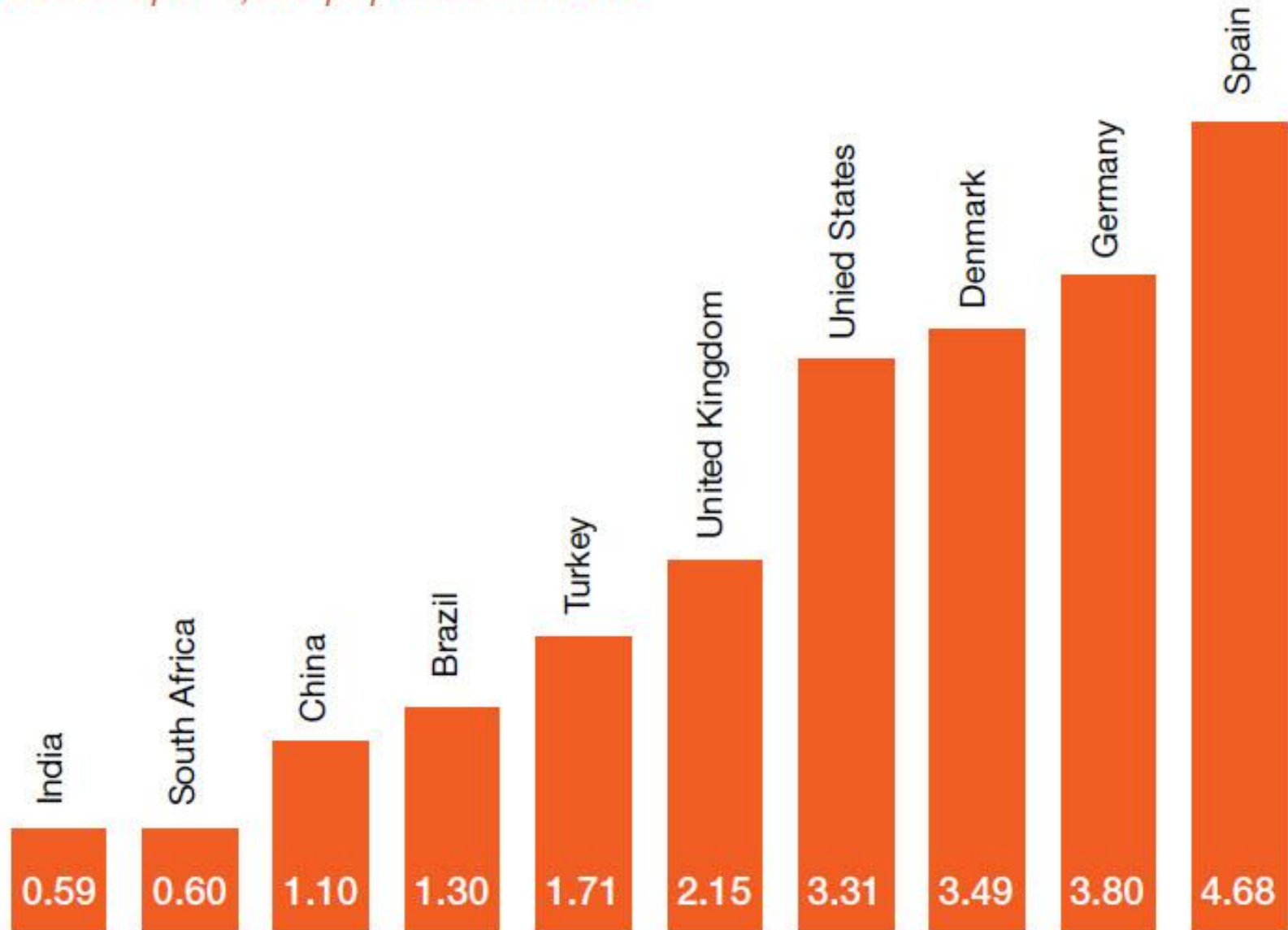
India	South Africa	China	Brazil	Turkey	United Kingdom	Unied States	Denmark	Germany	Spain
0.59	0.60	1.10	1.30	1.71	2.15	3.31	3.49	3.80	4.68

Chart 20: More mHealth services are covered by payers in emerging markets than in developed countries

% of respondents who say their organisation has started to pay for the following types of services provided via mobile devices

Telephone-based consultations

Difference*

29%

14%

43%

Access by patients to portions of his/her medical record

25%

14%

39%

Administrative communication (e.g., appointment reminders)

34%

5%

38%

Text-based consultations

23%

14%

37%

Drug adherence and other health-related communication

24%

12%

37%

Analysis of general health and wellness data gathered by the patient's mobile devices

23%

12%

35%

Medical professionals receiving data as part of patient monitoring

23%

10%

33%

Video consultations

21%

3%

24%

Developed markets   Emerging markets
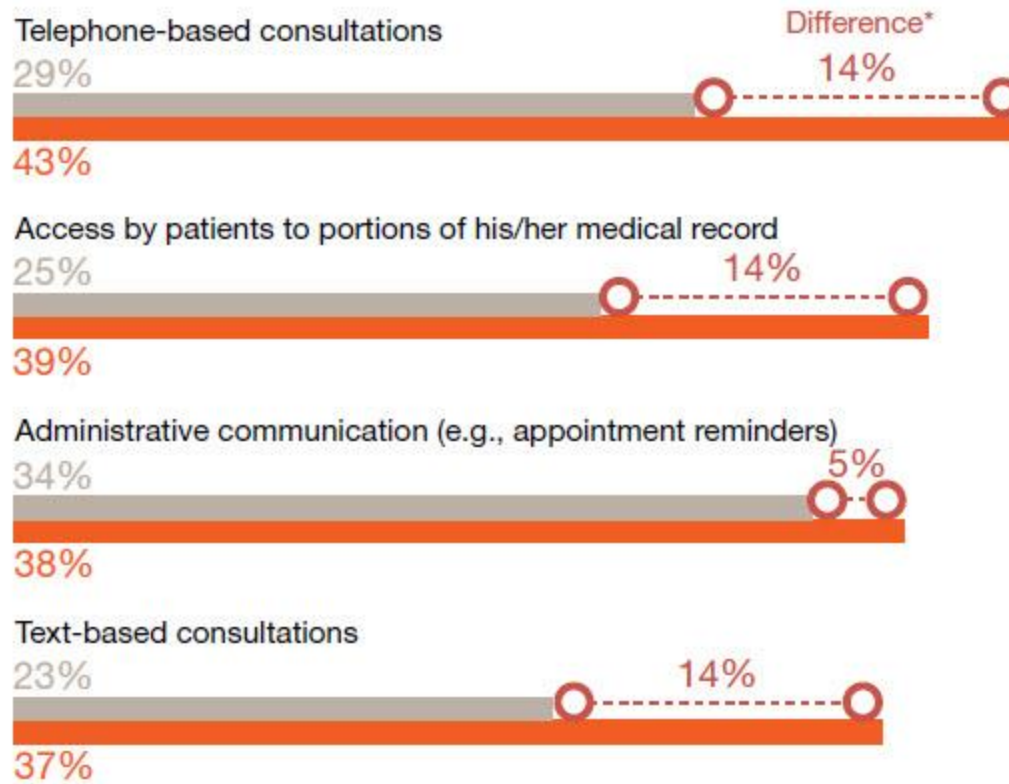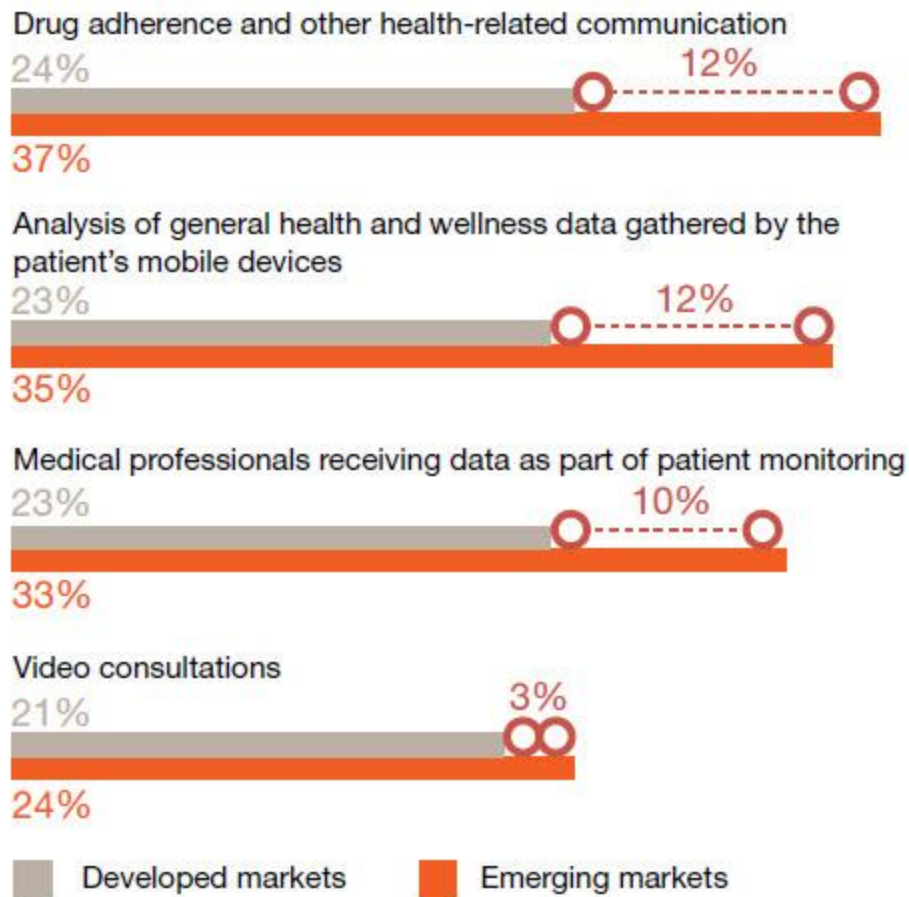
*Numbers may differ due to rounding

Source: Economist Intelligence Unit, 2012

World Bank mHealth Summit
(October 2009)

In the Veterans Affairs monitoring program

the average cost of $1,600 per patient a year was much lower than

the $13,121 spent by the department to provide home-based primary care without the "tele" component.

The department also compared the low cost of its telehealth services with the

$77,745 per patient a year spent on nursing home care.

Department of Veterans Affairs (2008) suggests possibilities for savings

From 2003 to 2007, researchers tracked a large group of patients with serious conditions, including congestive heart failure and chronic obstructive pulmonary disease.

Patients who enrolled in a "home telehealth" program were given biometric devices to monitor and record their vital signs.

The department said that these patients showed a 25 percent drop in the number of bed days of care and a 19 percent drop in hospital admissions, compared with the time they were not in the program.

DESPITE the promise of big savings, relatively few patients are being monitored with existing technology.

Chuck Parker, executive director of [Continua Health Alliance](#), an mHealth industry group, estimates that

only 50,000 to 70,000 patients

in the United States are monitored today.

One obstacle to wider adoption, Mr. Parker says,

is a lack of financial incentives for some major players in health care such as

hospitals. Noting that cardiac patients can be monitored at home for a fraction of

the cost of occupying a hospital bed, he said hospitals have "some fear about the

financial implications" for their own operations.

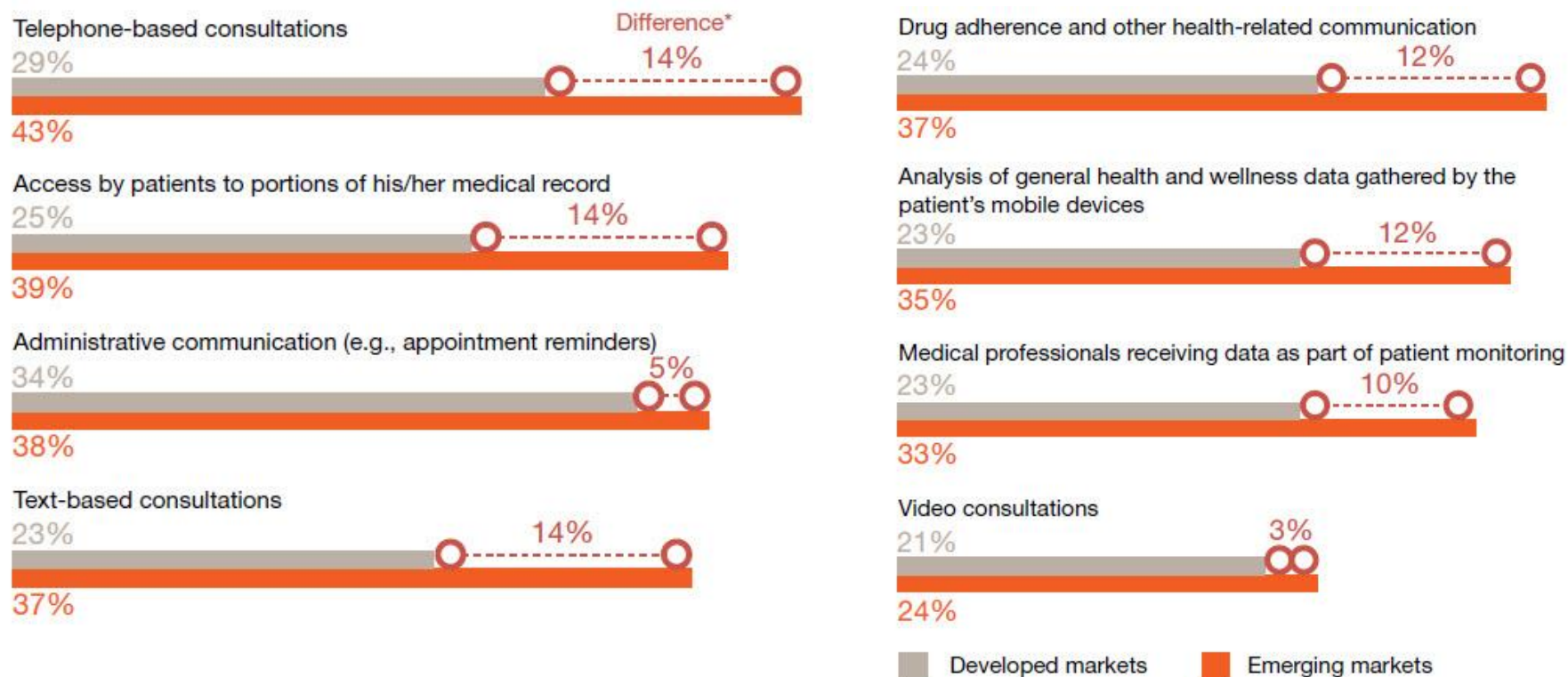**Chart 5: Patients define mHealth in terms of access and control**

How patients define mHealth

44% Use of mobile phone to learn about/monitor wellness (e.g., weight, diet, amount of exercise)

43% Contact between patient and healthcare provider by mobile phone or other device

42% Accessing health telephone call centres/advice lines/emergency services

29% Automated contact with my healthcare provider (e.g., reminders about appointments or to take medication)

25% Healthcare providers monitoring a specific patient condition (e.g., chronic disease)

18% Community health promotion or information initiatives sending messages to mobile phone

18% Medical professionals having remote access to electronic patient records

14% Support for medical professionals making decisions remotely

5% Collecting patient data for clinical trials

Chart 20: More mHealth services are covered by payers in emerging markets than in developed countries

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29%
Difference*
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■ Developed markets   ■ Emerging markets
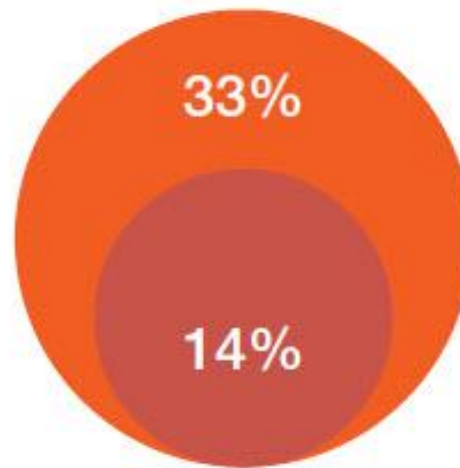
*Numbers may differ due to rounding

Source: Economist Intelligence Unit, 2012

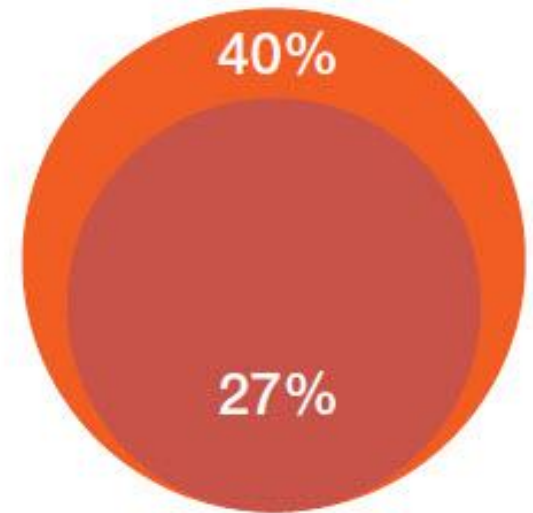# Chart 15: A technology gap exists between private and public sectors

Doctors with access to wireless Internet at work

63%

40%
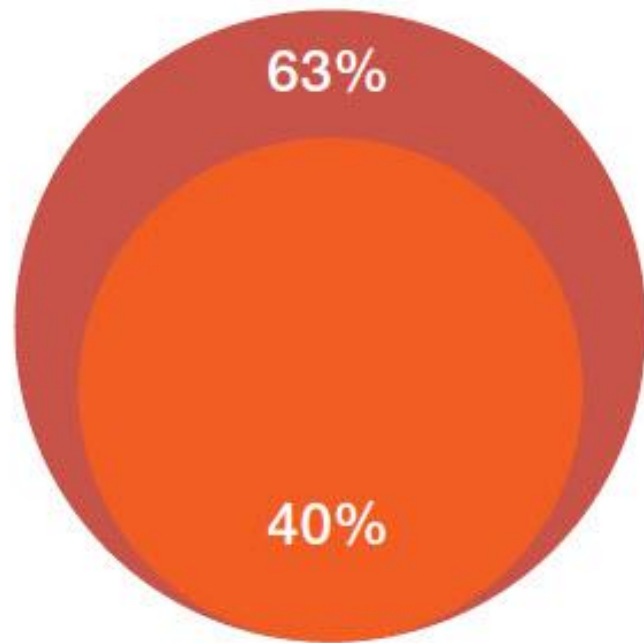
Doctors without access to mobile Internet at work

33%

14%

Doctors who think lack of necessary technology is a leading barrier to greater adoption of mHealth applications/ services at work

40%

27%

⬤ Private sector ⬤ Public sector

M Bensink et al.

A systematic review of successes and failures in home telehealth

Device	Number of projects
Telephone alone	57*
Telephone combined with additional device	17
Videophone	8†
Composite device with videophone	8
Composite device without videophone	29
Computer	1‡
Mobile phone	1
Multiple devices	1
Internet	7
Still image videophone	1
Total	*130*

M Bensink et al.
A systematic review of successes and failures in home telehealth

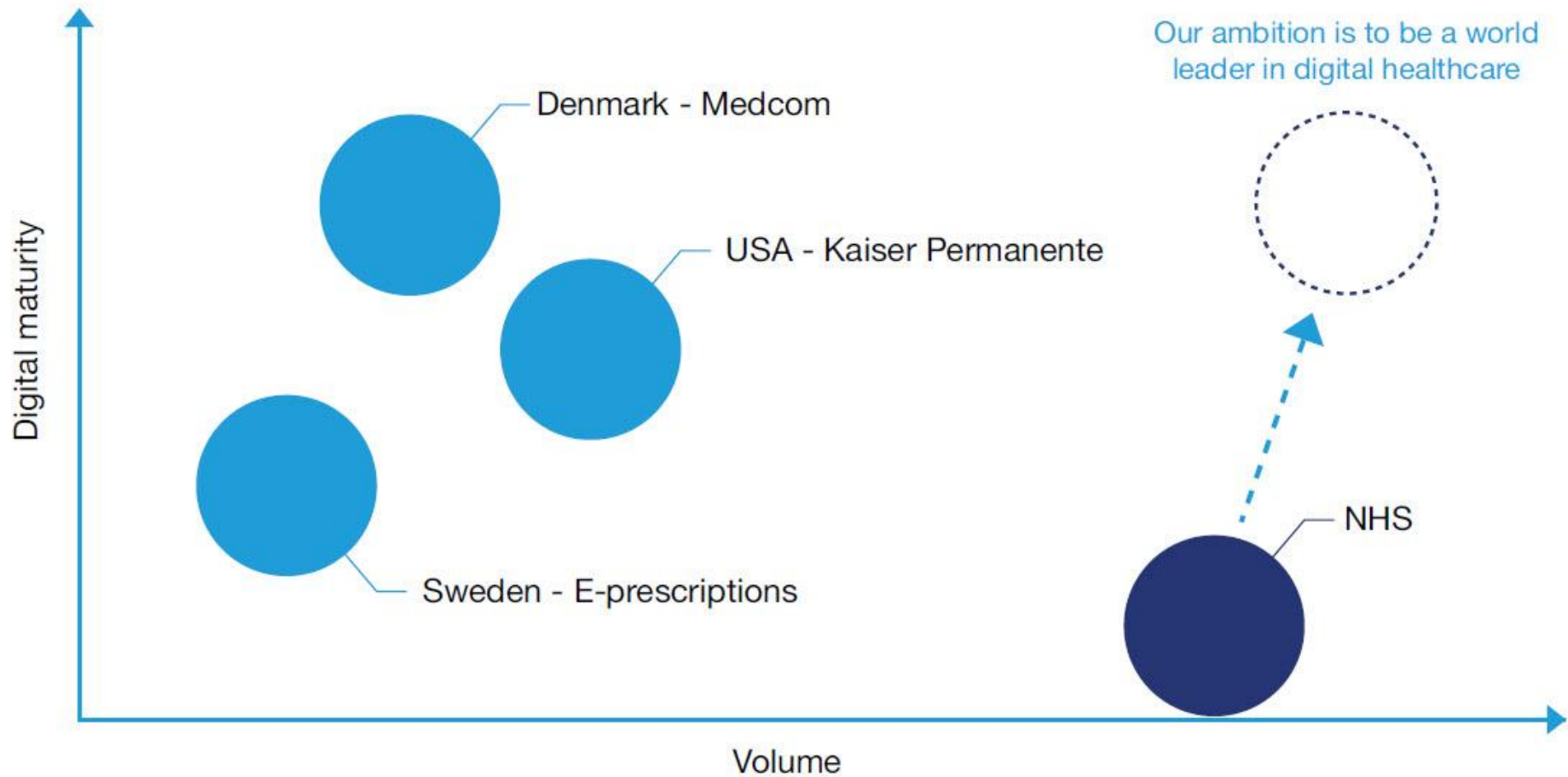| Disease/condition category	Number of projects
Diabetes	21
Mental health	16
High risk pregnancy	14
Heart failure	12
Cardiac disease	10
Caregiver	8
Cancer	8
Smoking cessation	6
Asthma	5
Hypertension	5
Home care	4
Arthritis	3
Hypercholesterolaemia	3
Chronic disease management	2
Total	130
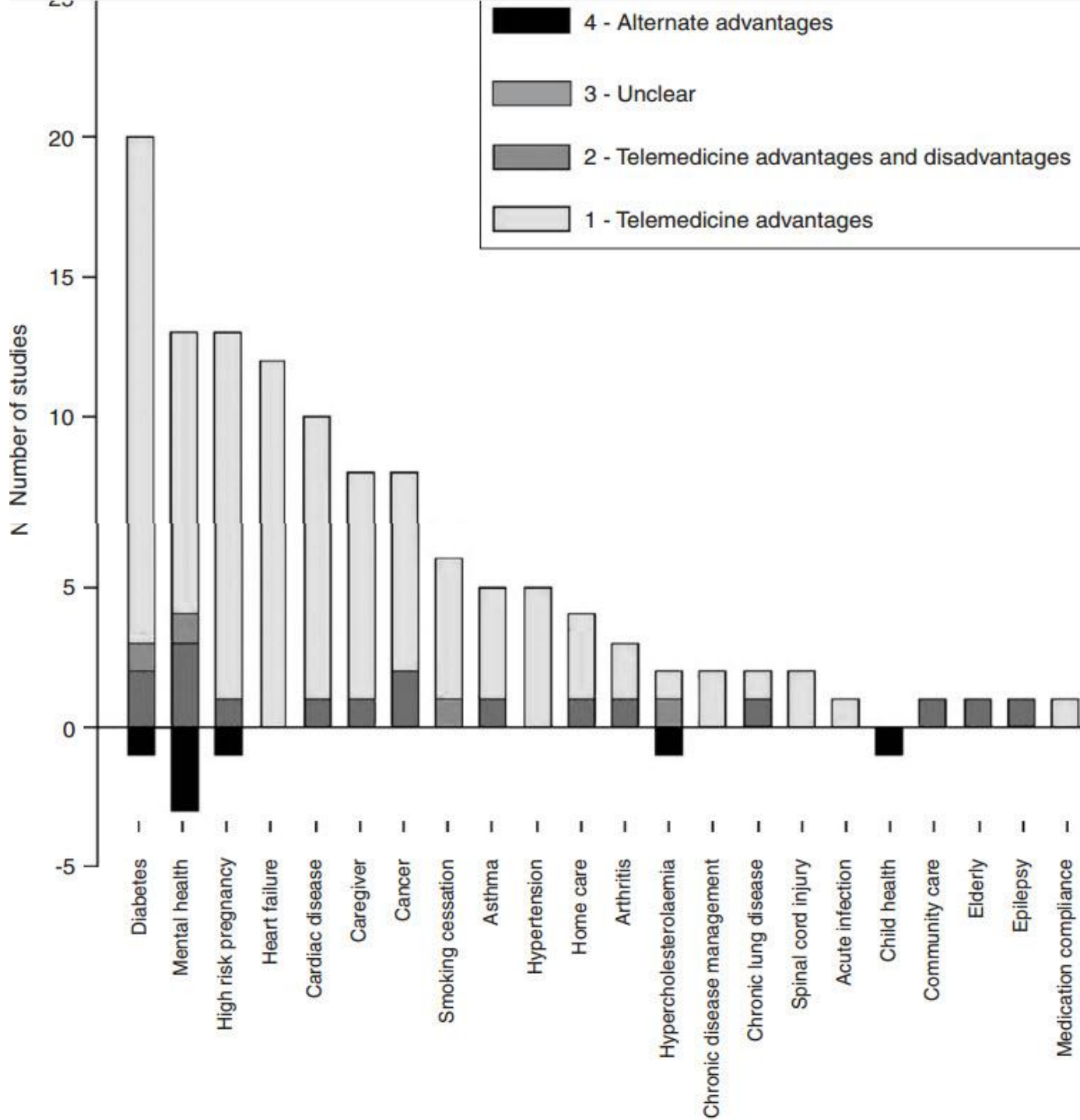
Европейский опрос 2012 года показал, что 26% имеют iPad и используют его 25% времени.
В 2011 году 30% американских врачей имели iPad и 28% планировали приобрести его в течение 6 месяцев.

Врачи не хотят изменений в своем традиционном положении. Только 27% из них советуют своим пациентам использовать m-Health приложения для управления своим здоровьем, тогда как 13% активно уговаривают не делать этого

Type of message	% digital
Discharge letters from hospitals to GPs	99
Referrals from GPs to hospitals	81
Lab results from laboratories to GPs	99
Lab test orders from GPs to laboratories	99
e-Prescriptions from GPs to pharmacies	85
Reimbursement from GPs to public health insurance	99
Notifications of admission / Notifications of discharge from hospitals to municipalities	98
Rehabilitation plans from hospitals to municipalities	80

NHS - Digital First-The delivery choice for England's population, 2012

Digital maturity (y-axis) vs Volume (x-axis)

Denmark - Medcom

USA - Kaiser Permanente

Sweden - E-prescriptions

NHS

Our ambition is to be a world leader in digital healthcare

NHS - Digital First-The delivery choice for England's population, 2012

International standards for mobile health - Continua Allaince

Continua Alliance

Goals:

Adopt international standards

Implement device & system design guidelines

Accomplish end-to-end system interoperability globally

Early stage industry with huge potential

- Against the backdrop of an obviously unsustainable healthcare system....to which we have just *increased access*...
- Increased recognition of the wireless healthcare opportunity
- ...which we have been talking about for 10 years
- ...with business models which remain challenging