



**Мониторинг здоровья пациентов на  
дому, как компонент реализации  
Концепции информатизации  
здравоохранения России**

**Медведев ОС, Яцковский МЮ, Баландин  
С.**

**МГУ им. Ломоносова, ООО «МедСофт»,  
Кооперация «FRUCT»**

**Москва 2011 г**

# Average Healthcare Spend as % of Gross Domestic Product for Member States in Study

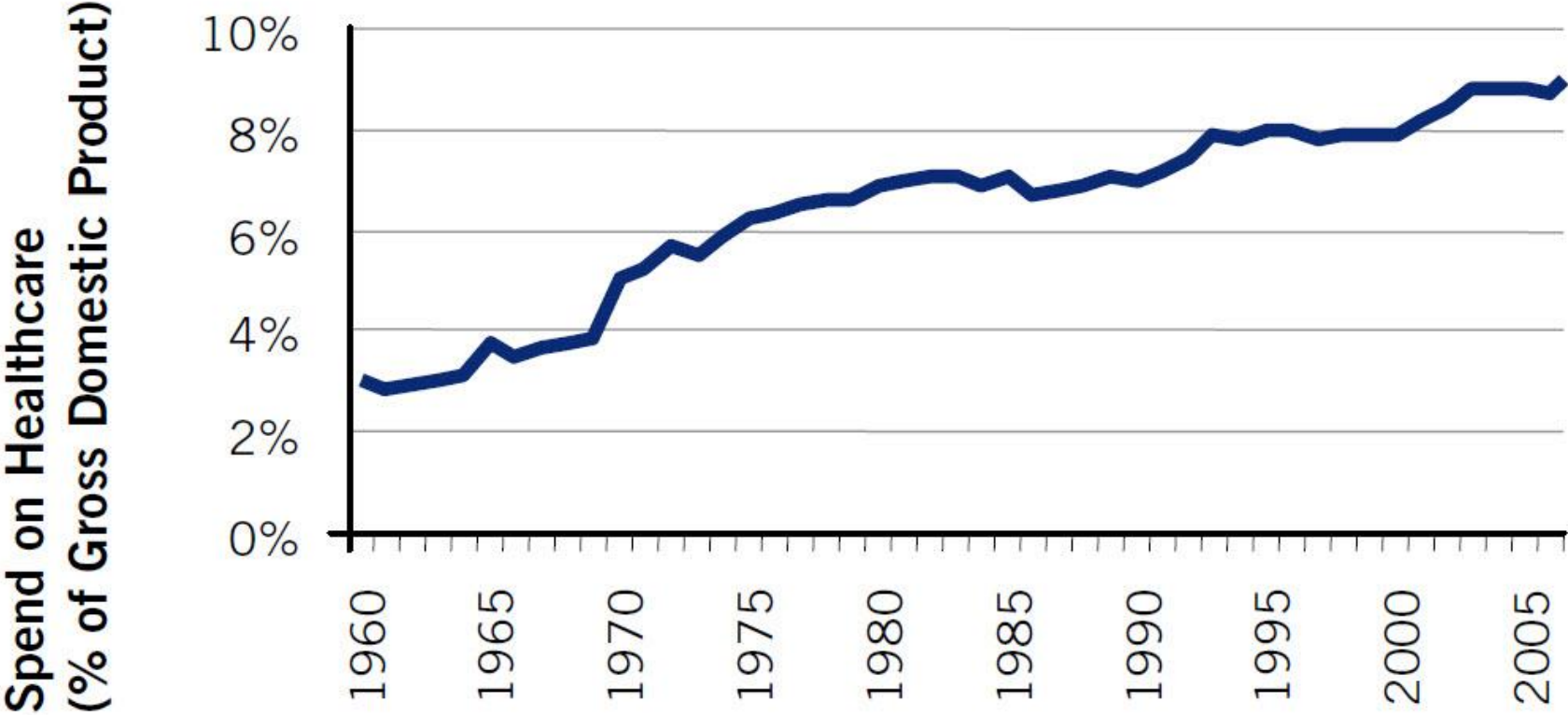


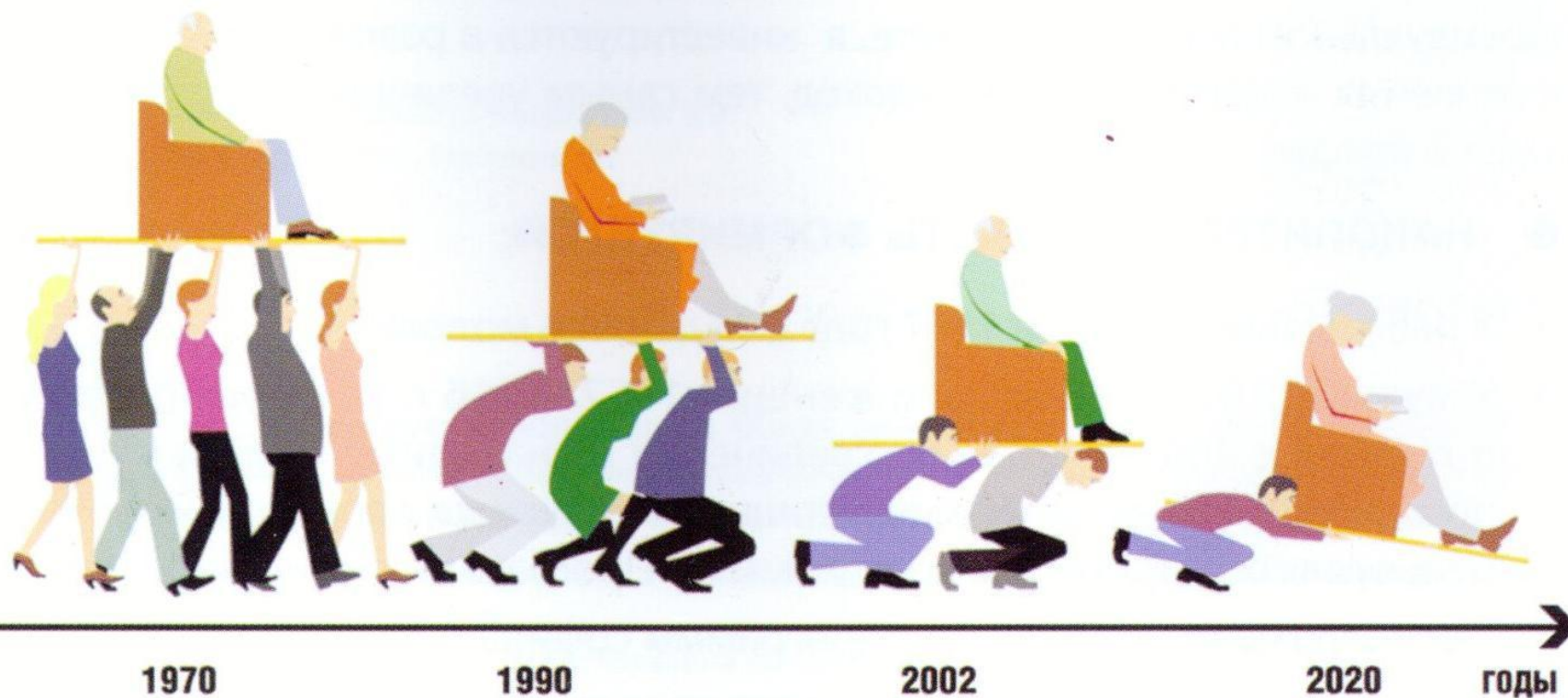
Figure 1. Healthcare Spend for Member States in Study

# Проблемы, стоящие перед здравоохранением

1. ПОСТАРЕНИЕ НАСЕЛЕНИЯ - УВЕЛИЧЕНИЕ ЧАСТОТЫ ХРОНИЧЕСКИХ ЗАБОЛЕВАНИЙ
2. РАСТЕТ ЧИСЛО ОСЛОЖНЕНИЙ, СВЯЗАННЫХ С ПРИЕМОМ БОЛЬШОГО КОЛИЧЕСТВА ПРЕПАРАТОВ
3. ВОЗРАСТАЕТ МОБИЛЬНОСТЬ НАСЕЛЕНИЯ



## Соотношение трудоспособного населения и пенсионеров



Именно поэтому в 2002 году в нашей стране стартовала пенсионная реформа,

# Health and Social Care Costs

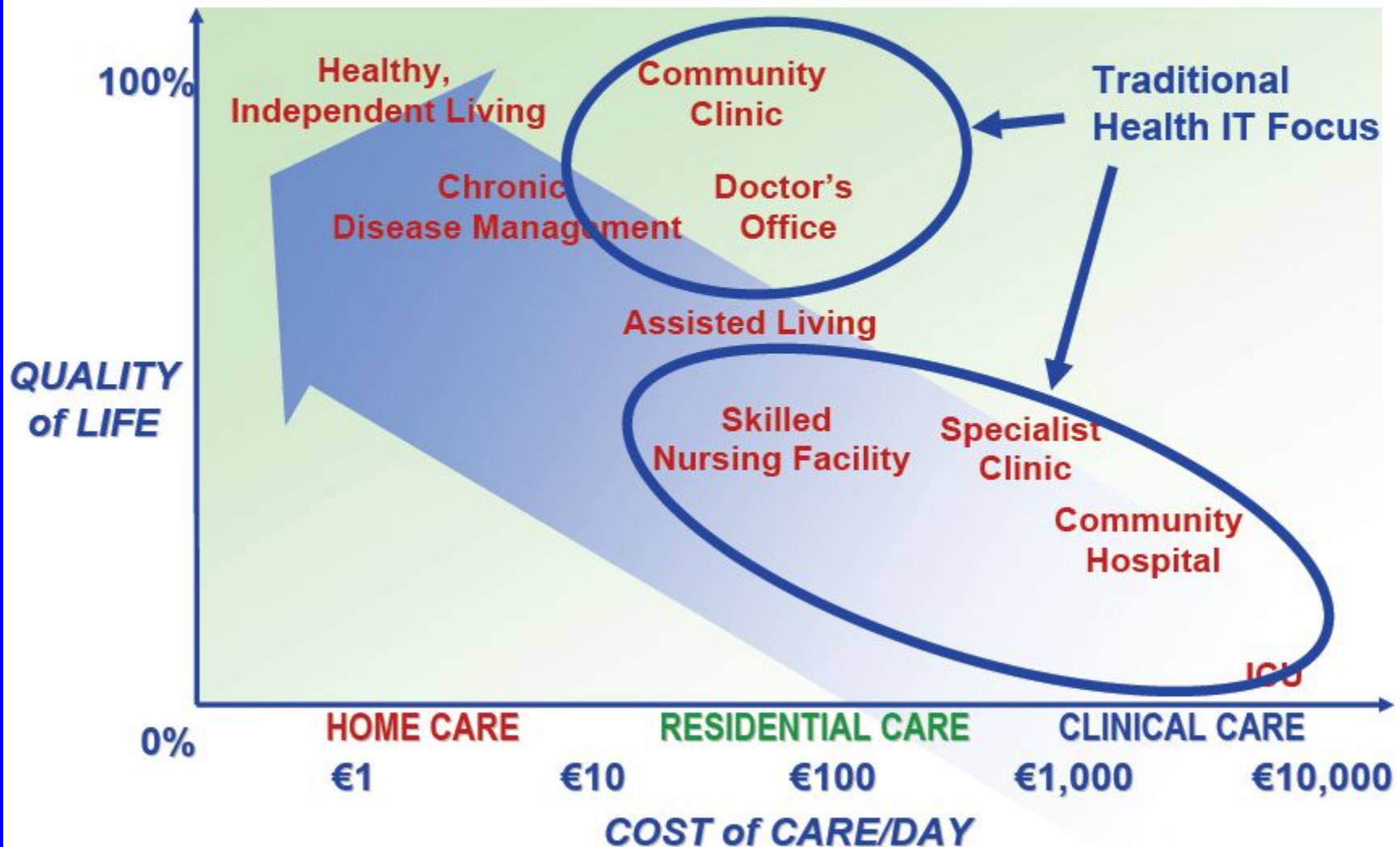


Figure 3. Adoption of mHealth initiatives and phases, globally

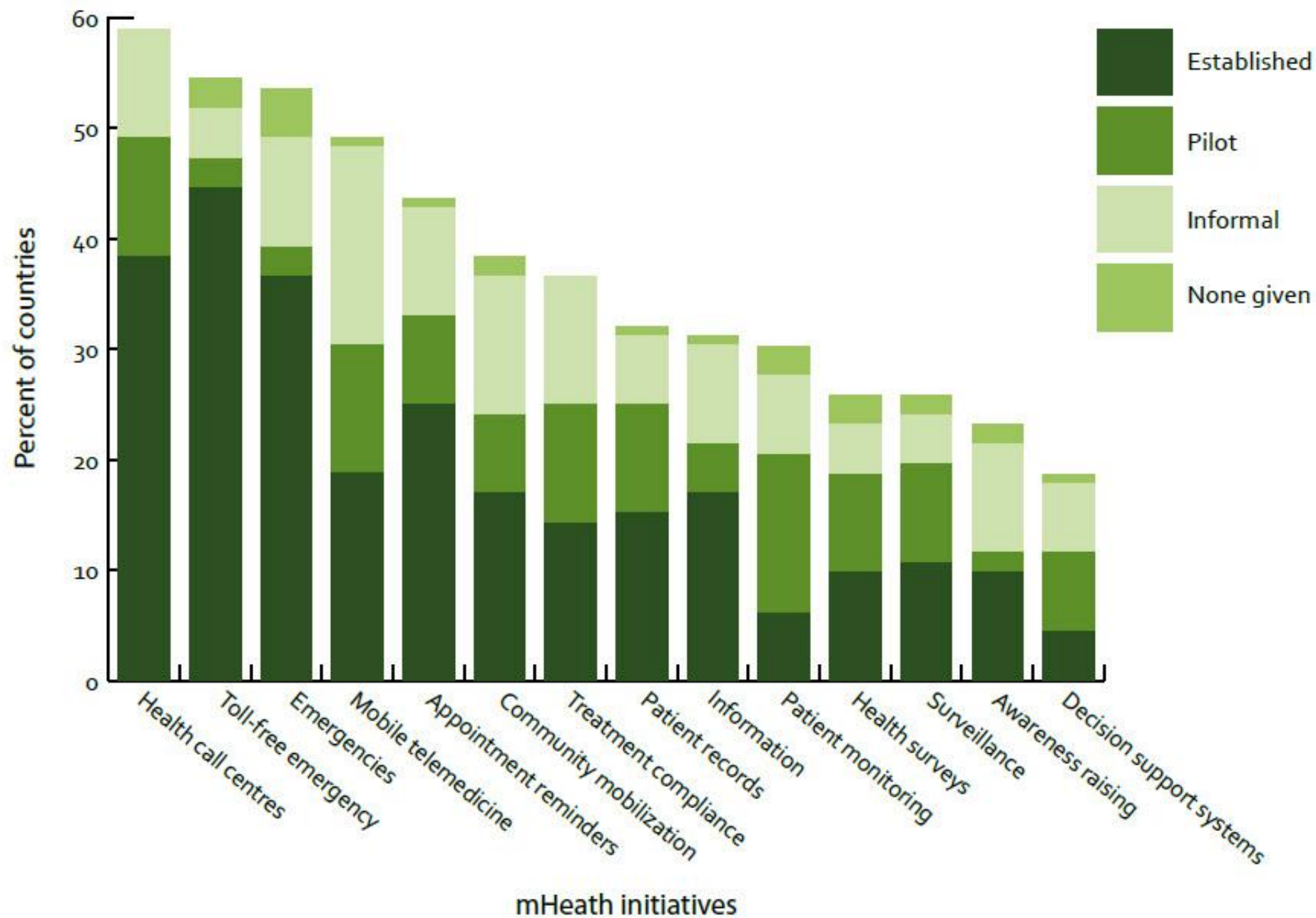
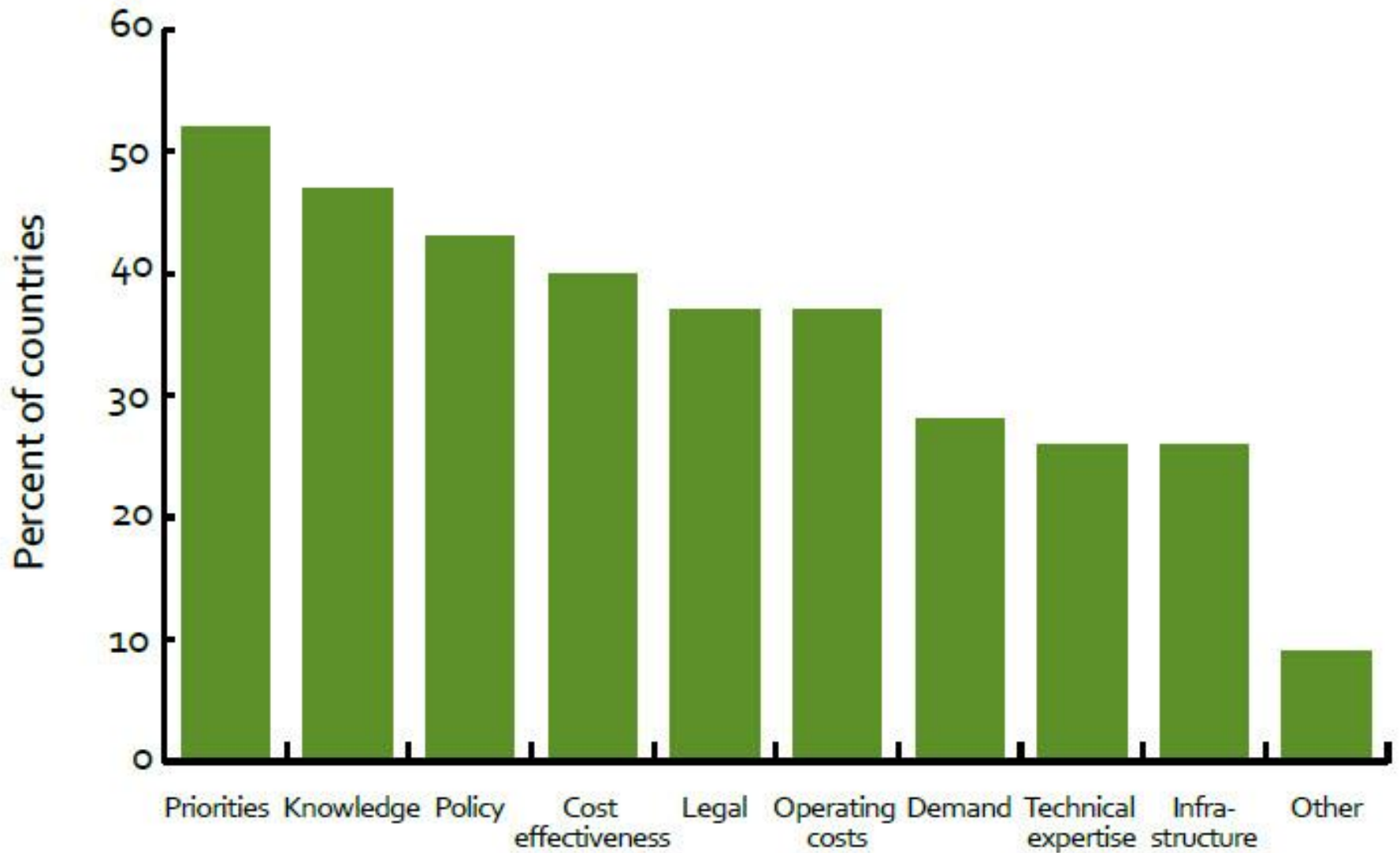


Figure 9. Barriers to mHealth implementation, globally





# Экономические выгоды удаленного мониторинга пациентов на дому

Heart Failure Care Comparison:  
RPM vs. Standard Care and Disease Management, Per Patient Per Year

	Management Cost	Average Readmissions	Cost of Readmissions <sup>##</sup>	Gross Savings v. RPM	Net Savings v. RPM
RPM	\$2,052 - Technology* \$2,082 - Technology & DM <sup>†</sup>	0.552 <sup>§</sup>	\$5,632		
Disease Management	\$750 <sup>†</sup>	1.116 <sup>**</sup>	\$11,387	\$5,755	\$3,703
Standard Care	0	1.320 <sup>††</sup>	\$13,468	\$7,836	\$5,034

New England Healthcare Institute, 2009  
Remote Physiological Monitoring



# World Bank mHealth Summit (October 2009)

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## m-Health: From Policy to Implementation

The World Bank Day @ mHealth Summit

<http://go.worldbank.org/MP5IY2CJA0>



Photo credit: Text to Change

October 28th, 9:00 a.m. - 5:30 p.m. Washington DC time  
Venue: 2121 Pennsylvania Ave., IFC Auditorium



**November 8-10, 2010 • WASHINGTON, DC**  
**Walter E. Washington Convention Center**

## **Call For Presentations Now Open!**

**Abstract Submission Deadline: July 1, 2010 - 11:59 PM EST**

The 2010 mHealth Summit will bring together leaders enabling cutting-edge research, evidenced based practice and innovative policy solutions to advance the benefits mobile technology can bring to the health and wellbeing of developed and developing world populations.

We are seeking abstracts for Presentations from the Public and Private Sectors that highlight ground-breaking health research, information and communication technologies, systems architecture and global partnerships that leverage mobile technology to improve global health outcomes.

Additionally, we are seeking Research Technology Demonstrations. Relevant technologies include: Mobile Phones, Smart Phones, Mobile Phone Apps, Global Positioning Systems (GPS), Personal Digital Assistants (PDAs), Mobile Electronic Sensors (e.g., Accelerometers), Portable Physiological Sensors (e.g., Ambulatory Glucose Monitors), Mobile Environmental Sensors, Integrated Mobile Devices, and other Wireless Technologies.

**СОСТАВ РЕГИОНАЛЬНОГО ФРАГМЕНТА ЕДИНОЙ  
ИНФОРМАЦИОННОЙ СИСТЕМЫ В СФЕРЕ ЗДРАВООХРАНЕНИЯ, А  
ТАКЖЕ ФУНКЦИОНАЛЬНЫЕ ТРЕБОВАНИЯ К ЕГО  
КОМПОНЕНТАМ, ОБЯЗАТЕЛЬНЫМ ДЛЯ СОЗДАНИЯ В 2011 – 2012  
ГОДАХ В РАМКАХ РЕАЛИЗАЦИИ РЕГИОНАЛЬНЫХ ПРОГРАММ  
МОДЕРНИЗАЦИИ ЗДРАВООХРАНЕНИЯ**

**7.4. Системы удаленного мониторинга состояния здоровья  
отдельных категорий пациентов;**

**Приказ №364 от 28 апреля 2011 г.**



# Монитор АД фирмы AND







# Mobile Cardiac Monitoring

## Bluetooth® ECG and Activity Monitor

### Applications

- Cardiac Rehab
- Cardiovascular Screening
- Home Monitoring
- Disease Management
- Atrial Fibrillation Screening
- Mobile Telemedicine
- Activity Monitoring
- Falls Monitoring
- Fitness Monitoring
- Sports Training



# Глюкометр с Bluetooth (Германия)



# Nonin Onyx 2 9560 Bluetooth Wireless Finger Pulse Oximeter with **FREE** case!!



9560  
*Onyx II*

**The first wireless fingertip pulse oximeter**

Oximetry Unplugged – Revolutionizing Disease Management. With the increased need for remote disease management, there is an opportunity to provide oximetry monitoring solutions to simplify the exchange of secure information.



# Беспроводная система мониторинга АД







Текстовые и  
голосовые  
напоминания

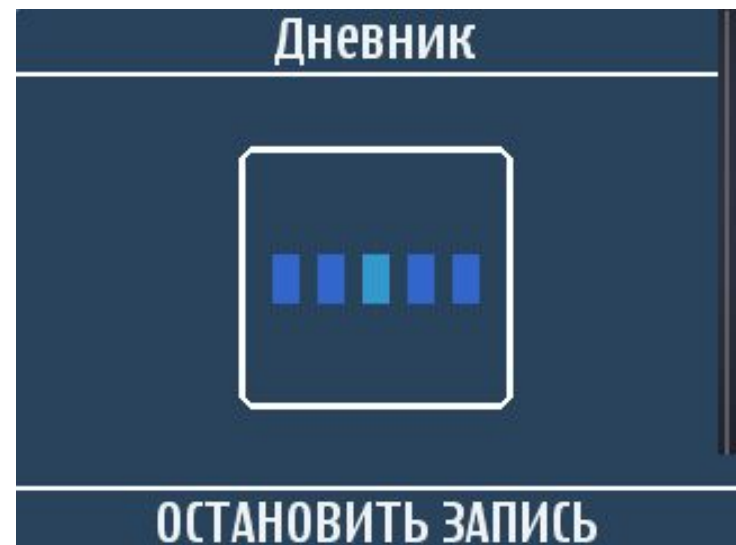
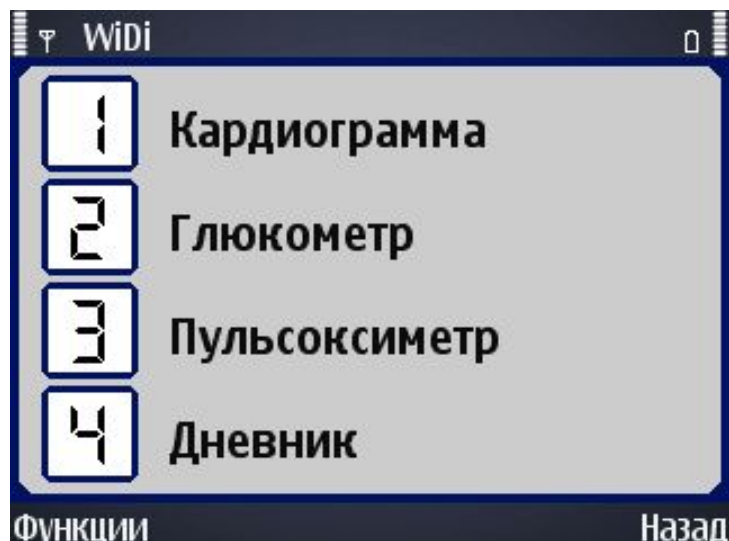


Напоминания о  
приеме лекарств  
(с  
подтверждением  
о выполнении)

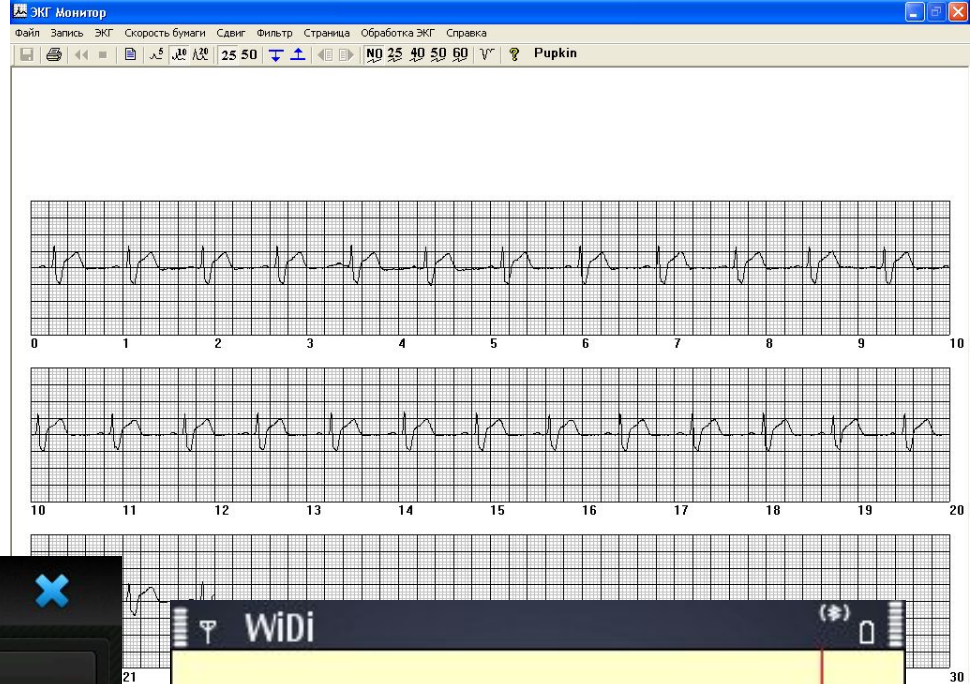


Динамика  
изменения  
мониторируемого  
параметра во  
времени

# Основные сервисы пациента. Мониторинг артериального давления.



# Мониторирование ЭКГ, двигательной активности





# Analysis of ECG on a Smartphone

**CardioView**

Иванов Иван Иванович...  
14:26, 28.08.08

Иванов Иван Иванович...  
14:16, 28.08.08

**Байбаков Иван**

Кардиограмма

**Статистика**

Длитель...	59 сек.
Средн....	77 уд./мин.
Мин. RR	0.695 сек.
Макс. RR	0.870 сек.
С.К.О.	48 мсек.
RMSSD	37 мсек.

Назад

**Кардиограмма**

25 мм/сек. 20 мм/мВ



**Кардиограмма**

Ритмограмма



Функции Выйти

**AliveECG :: Acceleration**


00:00:42 bpm

25mm/s, 10mm/mV



**Кардиограмма**

Вар. пульсограмма



Функции Выйти



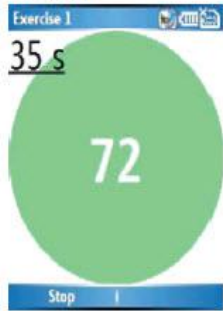


## Research Article

# Use of a Smartphone for Improved Self-Management of Pulmonary Rehabilitation

A. Marshall,<sup>1</sup> O. Medvedev,<sup>2</sup> and A. Antonov<sup>2</sup>

<sup>1</sup> School of Computing, University of Leeds, Leeds LS2 9JT, UK

<sup>2</sup> Faculty of Basic Medicine, Lomonosov Moscow State University, 1

Status	Screen shot	Other details
<ul style="list-style-type: none"><li>– Normal physiological conditions</li><li>– Heart rate within acceptable range specified by clinical professional</li></ul>		<ul style="list-style-type: none"><li>– Heart rate shown</li><li>– Time remaining in seconds shown</li><li>– Green background</li></ul>
<ul style="list-style-type: none"><li>– Normal physiological conditions, but near acceptable limits</li><li>– Heart rate higher or lower than normal, but still within acceptable range</li></ul>		<ul style="list-style-type: none"><li>– Heart rate shown</li><li>– Time remaining in seconds shown</li><li>– Amber background</li></ul>
<ul style="list-style-type: none"><li>– Dangerous physiological conditions</li><li>– Heart rate excessively high or low</li><li>– Exercise should cease now</li></ul>		<ul style="list-style-type: none"><li>– LOUD AUDIBLE WARNING SIGNAL</li><li>– Heart rate shown</li><li>– Red background</li><li>– STOP displayed</li><li>– Display freezes and remains in this state until the Stop button is pressed</li></ul>

# Общая схема решения



**Проф. Олег Медведев**

**+7-903-745-6208**

**medvedev.oleg900@gmail.com**

**Skype ID: omedvedev**