

DALY's based eHealth Programme in Slovakia

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TVORÍME VEDOMOSTNÚ SPOLOČNOSŤ
Európsky fond regionálneho rozvoja



Riadiaci orgán OPIS



Sprostredkovateľský orgán OPIS



Európska únia

Levels of questions dealing with eHealth

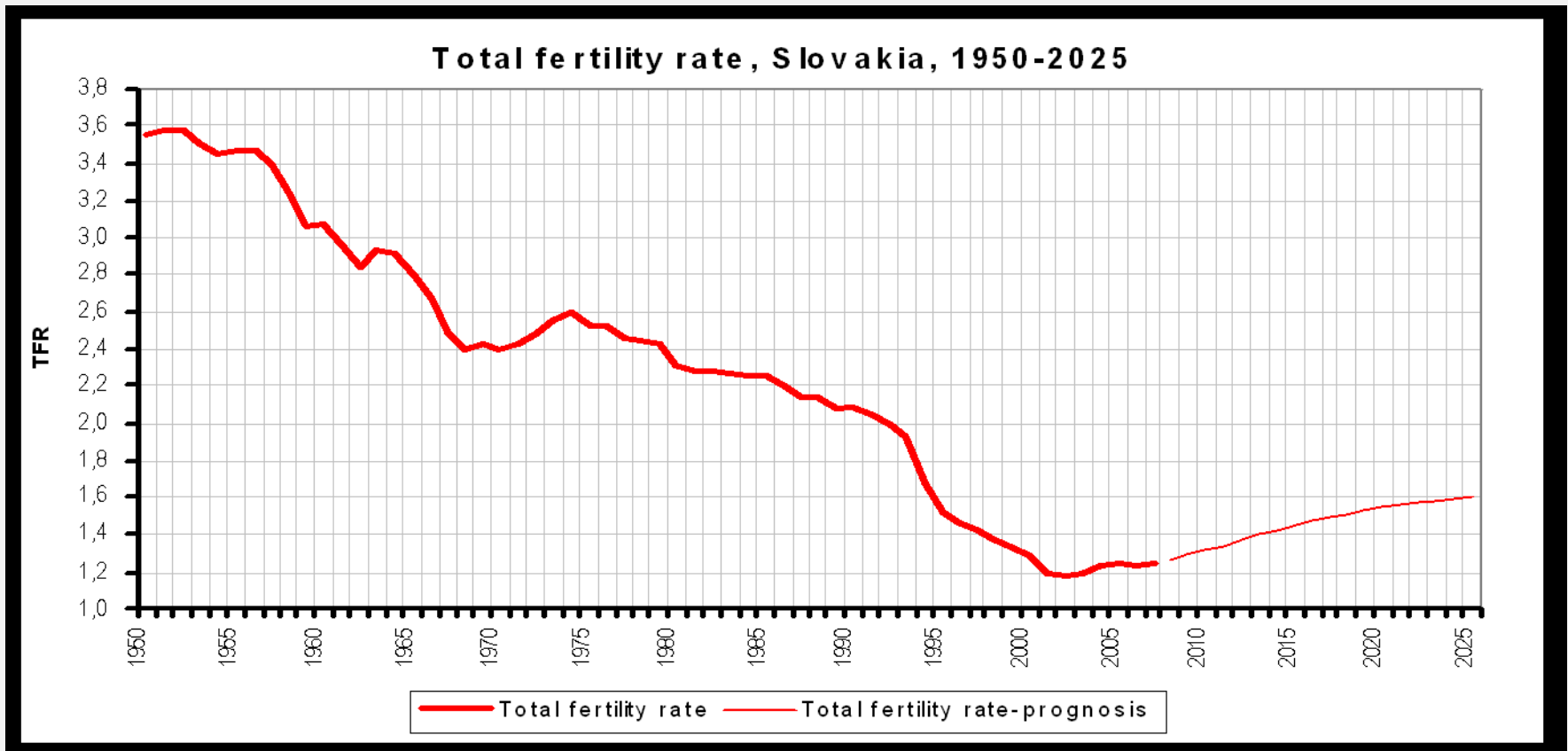
- ❖ **Why** eHealth? (Understand challenges and benefits)
- ❖ **What** to do? (Do right things)
- ❖ **How** to do it? (Do things right)
- ❖ **Who** will do it? (Right mix of state and private activities)
- ❖ **When** will be applications ready? (Realistic plans)
- ❖ **How much** it will cost? (Financial planning)

Challenges in healthcare (all EU)

- ✓ Ageing population / demographics crises
- ✓ Civilization diseases (+ growing part of child population with these diseases - diabetes)
- ✓ More possibilities (new drugs, examinations, therapy)
- ✓ More expensive medicine (genomics, proteonomics, ...)
- ✓ Healthcare for EU citizens without boundaries.
- ✓ Pandemics: HxNx (H1N1 now, H1N5 preparing)

But what about budget ?

Challenges: Demographic crisis



New paradigm of Health sector

Move from

patient's healthcare

to the

citizen's health

What does it mean?

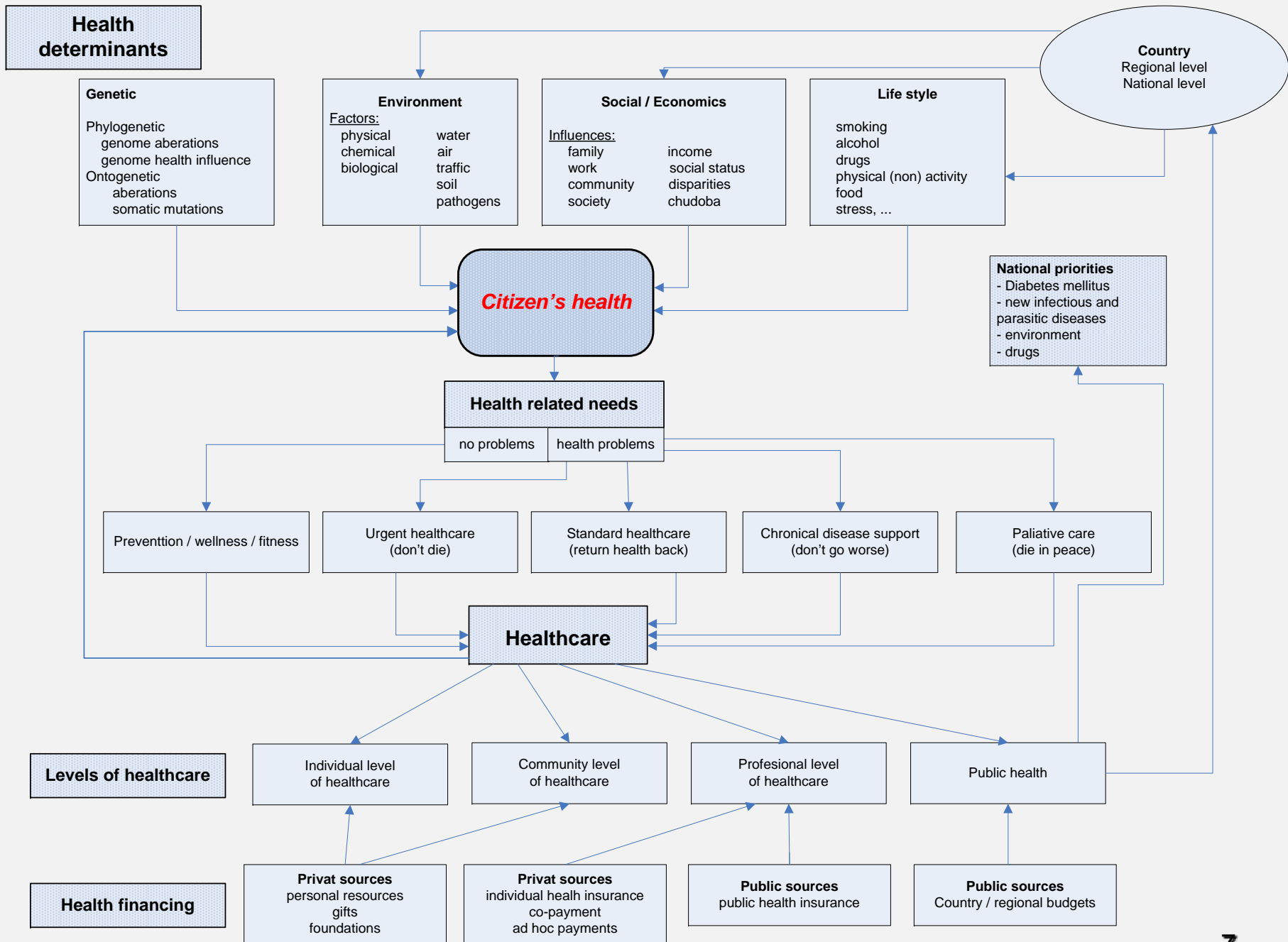
New paradigm of Health sector (citizen's health centric)

Management of all health determinants

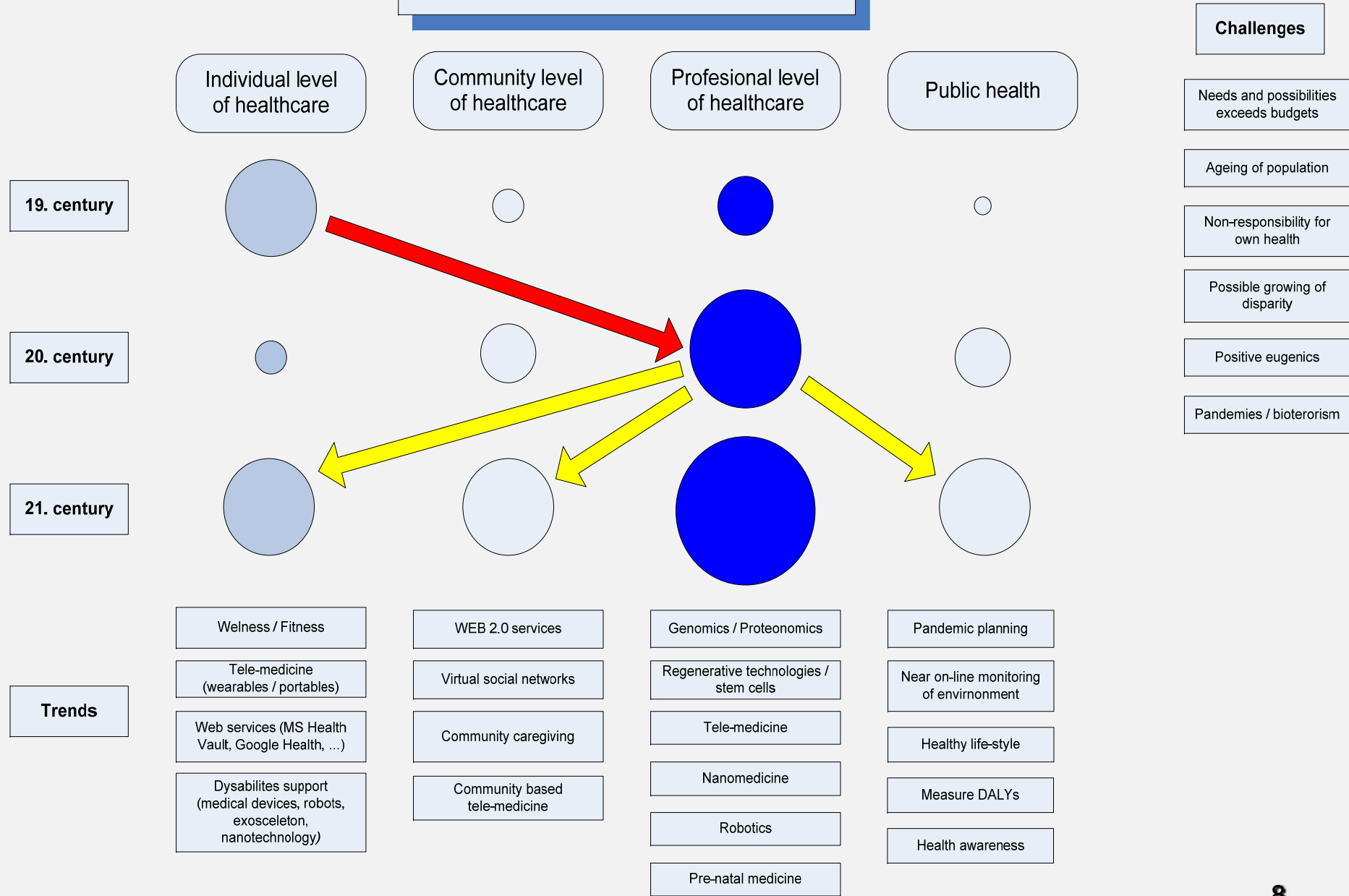
- ✓ Physical environment
- ✓ Social and economic environment
- ✓ Healthcare (**only 15 - 20 % influence on health**)
- ✓ Life-style
- ✓ Genetics

Support all forms of healthcare

- ✓ Individual level of healthcare (self-medication)
 - ✓ Community level of healthcare
 - ✓ Professional healthcare
 - ✓ Public health
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Trends in healthcare



WHO view on new paradigm

WHO defines health promotion as the process of enabling people to increase control over the determinants of health and thereby improve their health.

The five action points put forward by the Ottawa Charter for Health Promotion for constructing an effective healthcare strategy are:

- ✓ build healthy public policy
- ✓ create supportive environments for health
- ✓ strengthen community action for health
- ✓ develop personal skills
- ✓ reorient health services.

EU view on new paradigm

White paper: EU new Health Strategy

Together for Health: A Strategic Approach for the EU 2008-2013

Core Values mentioned in White Paper are:

- ✓ Citizens' empowerment.
- ✓ Reducing inequities in health.
- ✓ Health policy based on the best scientific evidence.

Three main challenges concerning EU health systems:

- ✓ Demographic changes including population ageing.
 - ✓ Pandemics, major physical and biological incidents, climate change.
 - ✓ New technologies which are revolutionising the way we promote health and predict, prevent and treat illness. These include information and communication technologies, innovation in genomics, biotechnology and nanotechnology.
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DALYs view on Health and eHealth

(Disability Adjustment Life Years)

Main notions in DALYs model (WHO):

- BoD- Burden of disease (0 – 1) 0: healthy, 1: dead
- YLL - Years of life lost due to premature mortality.
- YLD - Years of life lost due to disease burden.
- $DALYs = YLL + YLD$

DALYs based Health mission:

To reduce mortality, morbidity, persistent and temporal burden of disease and thus improve quality of citizens' life.

DALYs based eHealth mission:

To support Health mission by using ICT.

Similarly, the formula for YLD is:

$$YLD = \frac{I \times DW \times L (1 - e^{-rL})}{r}$$

where:

I = number of incident cases (-).
 DW = disability weight (-).
 L = duration of disability (years).
 r = discount rate.

If both age-weighting and discounting are applied, and the years between the event and the life expectancy are summed, the initially simple formulas for YLL and YLD become more complicated (formula for a single death). These formulas have also been programmed into calculation spreadsheet templates for DALYs that are available at the WHO website (see Annex 3.1).

$$YLL = \frac{KCe^{ra}}{(r+\beta)^2} [e^{-(r+\beta)(L+a)} [-(r+\beta)(L+a) - 1] - e^{-(r+\beta)a} [-(r+\beta)a - 1]] + \frac{1-K}{r} (1 - e^{-rL})$$

where:

a = age of death (years).
 r = discount rate (usually 3%).
 β = age weighting constant (e.g. $\beta=0.04$).
 K = age-weighting modulation constant (e.g. $K=1$).
 C = adjustment constant for age-weights (e.g. $C=0.1658$).
 L = standard life expectancy at age of death (years).

Similarly, by replacing the standard life expectancy in the YLL formula by the duration of disease and by multiplying by the disability weight, the YLD formula becomes the following (for a single disabling event):

$$YLD = DW \left\{ \frac{KCe^{ra}}{(r+\beta)^2} [e^{-(r+\beta)(L+a)} [-(r+\beta)(L+a) - 1] - e^{-(r+\beta)a} [-(r+\beta)a - 1]] + \frac{1-K}{r} (1 - e^{-rL}) \right\}$$

where:

a = age of death (years).
 r = discount rate (usually 3%).
 C, β , K = constants (see previous legend).
 L = duration of disability (years).
 DW = disability weight.

Life years lost in some countries

(statistics by WHO)

- † Austria: **970.000** lost years
 - † Bulgaria: **1.464.000** lost years
 - † Croatia: **709.000** lost years
 - † Germany: **10.414.000** lost years
 - † Greece: **1.393.000** lost years
 - † Italy: **6.789.000** lost years
 - † Slovakia: **834.000** lost years
 - † Slovenia: **282.000** lost years
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EU baseline for national eHealth

DG INFSO activities

- i2010 subgroup on eHealth
- eHealth Stakeholders' Group
- e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area
- i2010 - A European Information Society for growth and employment
- Seventh Framework Programme
- Draft Recommendation on eHealth Interoperability
- Projects – epSOS, Calliope, Stark

Strategic approach to eHealth in Slovakia I.

Baseline

- Health first, eHealth second
- From needs & requirements to solution & services
- Final KPI: decrease DALYs

Top down approach

- Healthcare mission, vision & strategy
- eHealth mission, vision & strategy
- Health and eHealth stakeholders needs and requirements
- eHealth benefits, cost-benefit analyses
- eHealth Programme charter, Programme Office
- eHealth Architecture, Standards
- ~~Projects & Activities~~

Strategic approach to eHealth in Slovakia II.

Strategic decisions

- ✓ One, state owned National eHealth operator
- ✓ Strong Programme management
- ✓ National eHealth portal
 - ✓ As authorized source of health information
 - ✓ As service bus and entry point of eHealth applications
- ✓ Integrated eHealth applications on National level
- ✓ PHR / EHR structure

Orientation on main stakeholders in eHealth

- ✓ Citizens / Patients
 - ✓ Euro-citizens
 - ✓ Healthcare professionals / Providers
 - ✓ Health insurance companies
 - ✓ Ministry of Health care
 - ✓ Politicians & Decision Makers
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eHealth benefits for stakeholders

Health:

- Decrease mortality, morbidity, burden of disease and injuries

Economical:

- Cut down expenses for all health care related activities and stakeholders
- Increase the efficiency of providing the health care
- Lower duplicities in examinations
- Lower the rate of errors and mistakes
- „Only healthy citizens can pay taxes“

Social:

- Reducing inequities
 - Increase citizens „well being“
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Slovak eHealth priorities

eHealth v. 1.0 (core of system)

- 👉 Start National eHealth operator: Programme Management office
- 👉 National eHealth portal as service bus for applications (CHF 2 based)
- 👉 National PHR
- 👉 eMedication / ePrescription
- 👉 eBookings
- 👉 epSOS / EU interoperability + Security

eHealth v. 2.0 (connect to Health ecosystem)

- 👉 Continue in v. 1.0 priorities
- 👉 From PHR to EHR
- 👉 SNOMED
- 👉 Telemedicine
- 👉 PACS
- 👉 e Public Health
- 👉 Genomics + Security

eHealth v. 3.0 (connect to eGovernment ecosystem)

preparing - feasibility study

National eHealth operator

Roles of National eHealth operator in Slovakia:

- ✓ Programme office for eHealth Programme
- ✓ Operator for National eHealth applications (Health portal, national PHR, ePrescription, eBookings, ...)
- ✓ Awareness dealing with eHealth for citizens and doctors
- ✓ National standards for health IT
- ✓ Health statistics, source of KPI of Health sector
- ✓ Health library
- ✓ Master data repository for demographic data of patients
- ✓ Archive for some PHR data
- ✓ National contact point for epSOS
- ✓ National health terminology + SNOMED

Timeline

ID	Activity	2008	2009	2010	2011	2012	2013
1	eHealth Programme mandate	█					
2	Catalogue of stakeholders needs	█					
3	National eHealth operator		█	█	█	█	█ →
2	Feasibility studies		█	█			
4	Tenders for eHealth v. 1.0		█	█			
5	eHealth v. 1.0		█	█	█	█	
6	Legislation changes			█	█		
8	First benefits for citizens				█	█	
7	eHealth v. 2.0				█	█	█
8	Next benefits for citizens					█	
9	eHealth v. 3.0					█	█ →

eHealth related domains in Programme

- K1. National legislation
- K2. EU legislation
- K3. National standards
- K4. International standards
- K5. Architectural framework
- K6. Certification / Accreditation
- K7. Network layer HIN
- K8. Support for HIN
- K9. Data store in HIN
- K10. PKI infrastructure in HIN framew.
- K11. Master Data repository
- K12. Infrastructure for EHR
- K13. Infrastructure for EDS
- K14. National Health Portal
- K15. epSOS – National Contact Point
- K16. Health Professional Card
- K17. Health Insurance Card
- K18. Infrastructure for ePrescription
- K19. Infrastructure for eReferrals
- K20. Middleware for integration
- K21. IS for ambulances
- K22. IS for pharmacies
- K23. IS for laboratories
- K24. Radiologic IS / PACS
- K25. Clinical IS
- K26. IS for Blood Transfusion Service
- K27. IS for Integrated Rescue System
- K28. IS for rescue services
- K29. eRefferals
- K30. ePrescription
- K31. IS of Public Health
- K32. Monitoring the providers of HC
- K33. Integration into Nat.Health Portal
- K34. Call center for eHealth
- K35. Telemedicine applications
- K36. Evidence based medicine supp.
- K37. IT support for DRG
- K38. EU mobility of insured citizens
- K39. eLearning in eHealth area
- K40. IT in new areas of medicine
- K41. R&D in eHealth area
- K42. Using token for more purposes
- K43. Integration into eGovernment
- K44. PR / acceptance by stakeholders
- K45. IS for subjects of regional government in health care

PHR / EHR structure

Granularity is the key in the Slovak PHR – citizens electronic Health book
PHR as set of pages

- Page: minimum logical and consent management unit)
- Every page – special archetype

Example of pages

- Patient summary (epSOS maximum set compliant)
- Health assurance account
- Medication history
- Genealogy linkeages
- Genetic risks
- Vaccinations page
- Pregnancy page
- Childhood page
- Tele - data
- Wellness / Fitness data
- EHR links
- Specialized

Example: Catalogue of needs

(more than 600 needs identified)

ID	eHealth domains	Health Portal	ePrescription	PHR	eBookings	Telemedicina	Genomics	PACS	eConsulting	eWarnings	eLearning
	Needs (citizen)										
1.1	To find information dealing with health related issues - health risks, examinations, therapy, GPs, hospitals, etc.	X								X	X
1.2	To get support for decision making in care process of own health or family members health (ex. - visit GP?)	X		X	X	X	X		X	X	X
1.3	To get drugs from pharmacy without physical visit of it.	X	X								
1.4	To have possibility monitor own body parameters (blood pressure, temperature, biochemistry).	X		X		X					X
1.5	To get support for decision making based on actual level of body parameters.	X							X		
1.6	To get support from applications, that diminish time spent in hospital and to receive support from healthcare in home.	X				X			X		X
1.7	To have possibility get devices , that diminish time spent in hospital and supporting people with dysfunction in homecare.					X					
1.8	To have somebody, who can be anonymous consultant for citizens health problem.	X		X					X		
1.9	To get support for optimizing dosage of drugs without visiting GP.	X	X	X							
1.10	To get support in case of emergency until emergency will arrive. .	X				X			X		
1.11	To have baseline skills dealing with first aid.	X									X
1.12	To get information dealing with health systems a health risk abroad.	X								X	