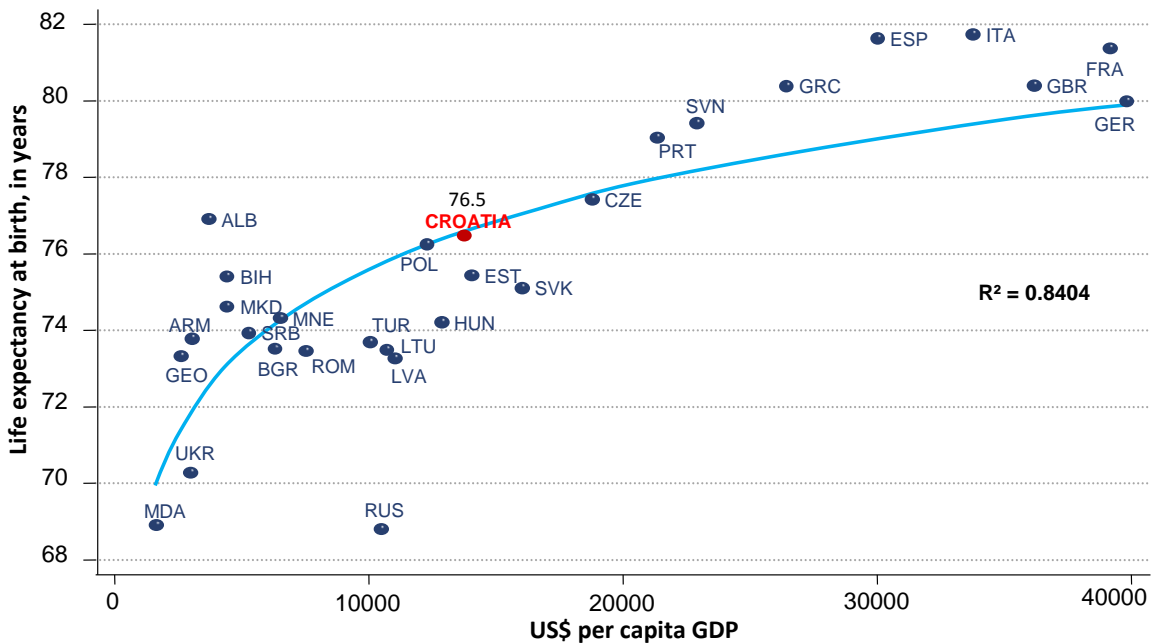


CROATIA
PROGRAM-FOR-RESULTS
IMPROVING QUALITY AND EFFICIENCY OF HEALTH SERVICES
TECHNICAL ASSESSMENT

1. This technical assessment has been carried out as part of the preparation of the Health Program-for-Results (PforR) operation in Croatia. The primary focus of the assessment is on the Government’s Program, and the National Health Care Strategy 2012–2020, and serves as the policy framework for this operation.

2. **The Croatian health system produces reasonably good outcomes, but at high costs that are difficult to sustain in an environment of fiscal constraints.** Health sector reforms implemented over the last 20 years have gone a long way to improve the Croatian health system’s performance, which produces robust results both in terms of health outcomes and public satisfaction. Through these reforms the current system is now more centralized with better regional balances in terms of funding and human resources, complementary and private insurances were introduced, a performance-based payment mechanism was implemented in hospitals and new regulations rationalized the expenditure on pharmaceuticals. Between 1990 and 2010, life expectancy at birth increased by four years (from 72.5 years to 76.5 years), infant mortality was reduced by more than half (from 10.7 to 4.4 infant deaths per 1,000 live births), and the age-standardized mortality rate decreased by 25 percent (from 1,060 to 790 deaths per 100,000 inhabitants). Also, with regard to the correlation between GDP and life expectancy at birth, Croatia’s life expectancy is one to two years longer than that of countries with similar income levels, such as Hungary, Slovakia, and Estonia (Figure 1).

Figure 1: GDP and Life Expectancy at Birth in Selected Countries, 2010



Source: World Development Indicators 2010. EU selected countries with GDP lower than US\$40,000

3. **Croatian health indicators also compare well with those of other countries in the region** (Table 1). On most indicators, Croatia is doing better than several East European countries and ranks between the old member states (OMS) of the European Union and the new member states (NMS). Croatia has completed the epidemiological transition in which the great burden of infectious diseases has now been replaced by chronic non-communicable diseases. The leading causes of death in Croatia are now heart and blood vessel diseases. In the last 10 years, the share of total mortality from these diseases has slightly declined from 53 percent to 49 percent of all deaths from all causes, while cancer, the second most frequent cause of mortality, slightly increased from 24 percent to 26 percent. The third cause of death is injuries and poisoning, diseases of the digestive system are fourth, and the fifth cause of death are diseases of the respiratory system.

4. Nevertheless, there are some areas that require special attention. Diabetes in Croatia is 54.7 percent higher than those in the NMS. Death rates due to cerebrovascular diseases, female breast cancer, traffic accidents, and smoking-related diseases in Croatia are also higher than the average for the NMS. These higher mortality rates are in many cases a result of high prevalence of behavioral risk factors such as an unhealthy diet, physical inactivity, overweight and obesity, smoking, and alcoholism. The results of the Croatian Health Survey (CHS) from the year 2003 showed that 15.9 percent of the adult population (20.2 percent men and 12.1 percent women) have bad eating habits.¹ Unsurprisingly, the CHS results showed that over 60 percent of men and 50 percent of women aged over 18 years old are overweight (with a BMI of more than 25 kilogram per square meter, which places Croatia among the countries with the highest numbers of overweight people. According to estimates from the World Health Organization (WHO), smoking in Croatia is the leading cause of the disease burden. CHS results have also shown that in Croatia 27.4 percent of people aged 18 and over are smokers (33.8 percent men and 21.7 percent women), which is more than the prevalence of smoking in either the old EU member states (25.6 percent) or the new member states (25.4 percent). During the period from 2000 to 2009, registered alcohol consumption in Croatia gradually increased. According to the WHO database, registered consumption of pure alcohol in Croatia in the year 2009 was 12.8 liters per capita, while the EU average was estimated to be 12.5 liters. Furthermore, in Croatia, about 7,500 people annually were treated for drug abuse either in hospital outpatient departments or as inpatients. The total number of people in treatment for drug abuse has generally been stable in recent years, and the number of new people entering the system has been decreasing.

¹ Croatian Health Survey (2003). Available at: <http://www.hcjz.hr/old/clanak.php?id=12389> [20.6.2012.].

Table 1: Health Indicators in Selected East European Countries 2009 and Croatia 2009 - 2010

	Croatia	Croatia	Czech Rep.	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Serbia	Slovakia	Slovenia	EU OMS	EU NMS
	2010		2009											
Life expectancy at birth, in years	76.9	76.4	77.5	75.3	74.5	73.3	73.2	75.9	73.6	74.1	75.4	79.5	80.8	75.2
Infant deaths per 1,000 live births	4.4	5.3	2.9	3.55	5.1	7.8	4.9	5.6	10.1	7.0	5.7	2.4	3.7	6.3
Maternal deaths p/100,000 live births	9.2	13.5	2.5	0.0	18.7	46.1	0.0	1.9	21.1	19.9	11.4	4.6	5.6	9.1
Age-Standardized Mortality rates per 100,000														
All causes, all ages	790	813	744	840	915	952	963	810	959	972	860	625	554	863
Ischemic heart disease, 0-64	32.5	31.6	29.5	40.3	53.0	71.7	64.7	27.1	49.3	34.3	47.4	17.4	15.2	38.6
Cerebrovascular diseases, all ages	109	114	79.1	66.2	90.8	132	119	72.4	170	145	94.4	66.2	41.9	108
Malignant neoplasms, 0-64	91.2	91.0	81.8	81.6	132	94.0	93.1	93.1	100	107	91.1	79.4	67.2	96.8
Malignant neoplasms, all ages	211	211	198	187	243	194	190	202	181	207	197	198	165	198
Cancer of the cervix, all ages	4.1	3.6	4.5	6.64	5.9	5.9	9.0	7.3	13.4	9.4	6.5	3.7	2.1	8.0
Female breast cancer, all ages	27.4	25.2	20.1	22.1	28.1	25.2	24.2	20.3	22.6	30.2	21.3	25.5	23.9	22.2
External causes, all ages	52.7	54.4	48.2	87.8	59.0	86.7	116	57.6	53.9	42.8	51.0	61.1	32.6	57.7
Motor vehicle traffic accidents, 0-64	8.9	10.9	6.6	6.7	8.1	9.7	11.1	10.1	11.8	8.6	6.8	7.4	5.9	9.5
Motor v. traffic accidents, all ages	9.6	11.6	6.9	7.2	8.5	9.6	11.4	10.7	12.7	9.0	7.2	8.1	6.2	10.1
Diabetes, all ages	20.2	19.8	13.2	11.0	17.9	14.9	6.9	13.7	8.2	27.0	10.8	7.5	12.4	12.8
Selected alcohol related causes	86.3	88.9	71.3	119	114	116	153	84.6	109	63.7	84.9	95.6	52.4	93.8
Selected smoking related causes	350	354	316	325	429	443	490	248	434	350	427	193	173	342

Source: <http://data.euro.who.int/hfad/>, July 30, 2012

Note : While 2010 data are available for Croatia, in the case of Hungary, Latvia, Lithuania, Serbia, Slovakia, and Slovenia, the last year for which data are reported in the European Health for All database is 2009.

5. **Like most other European countries, Croatia is facing a profound change in its population age-structure.** Due to this demographic transition, the Croatian population is aging considerably. Croatia's demographic pyramid (Figure 2) shows that Croatia reached stage 4 (contracting) of its demographic transition, with a negative natural population growth (-2 percent in 2010). Since 2001, the 65 and over age group has grown to be larger than the population aged under 15 years old (Figure 3). As the elderly population continues to increase, so will the burden of non-communicable (and chronic) diseases and the incidence and prevalence of co-morbidities. Therefore, there will be a substantial increase in the need for additional health services and long-term care services (LTC).

Figure 2: Population by Age, 2011

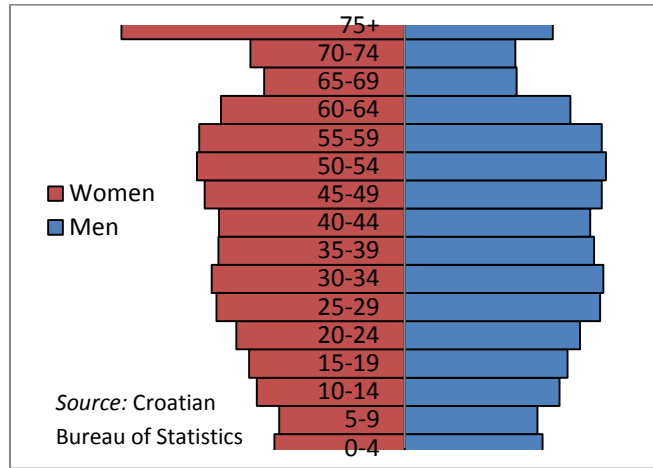
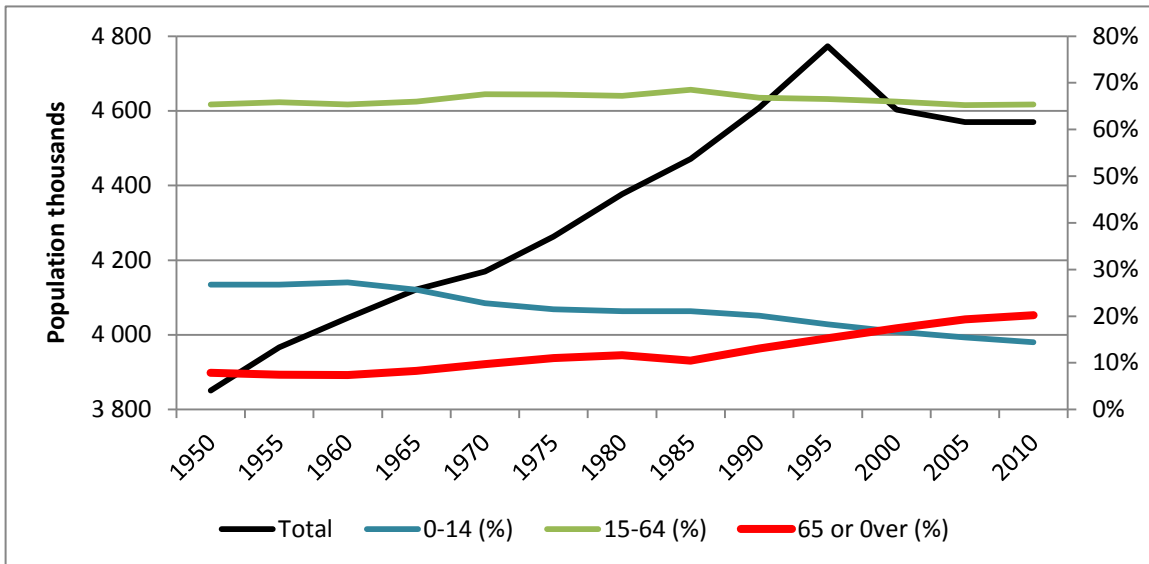


Figure 3: Total Croatian Population and Age Cohort Distribution over Time

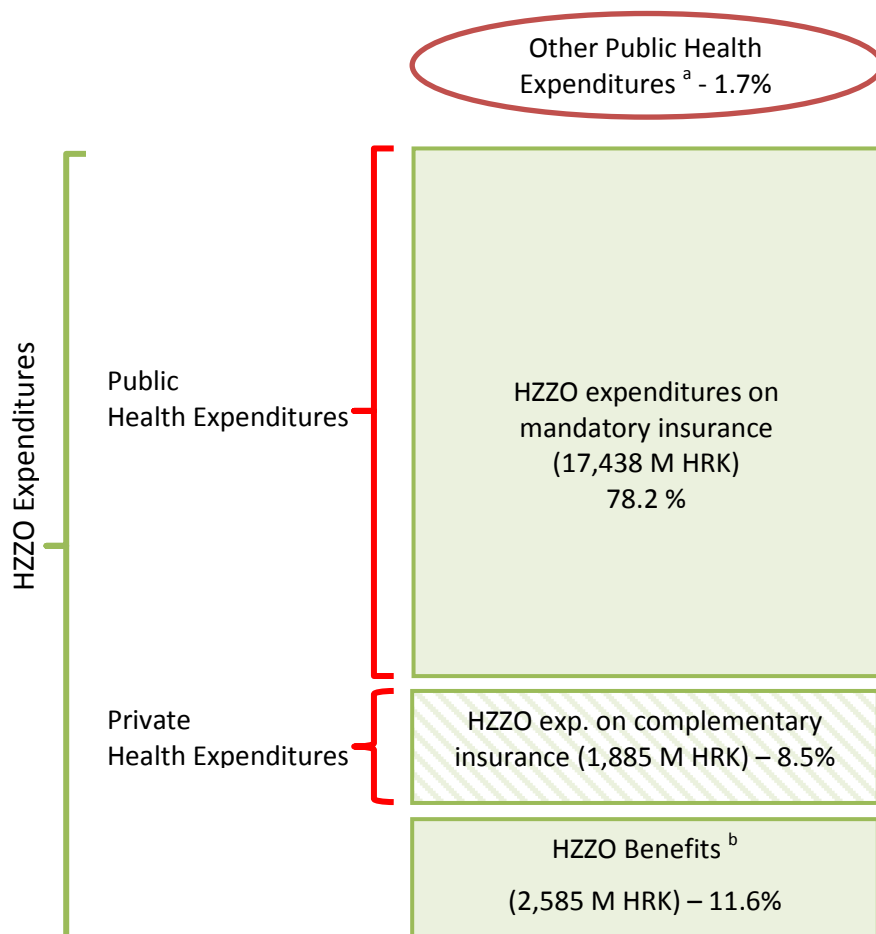


Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2008 Revision, <http://esa.un.org/unpp>, December 6, 2011

6. **However, good health outcomes come at a high cost.** With overall health spending at 7.8 percent of GDP, Croatia is near the top of the list compared to new EU members, and spends significantly more than countries with similar GDP per capita in the region. At 17.7 percent, the health sector’s share of public expenditures (about EUR 3.1 B – figure 1) is higher than the 15.6 percent average for all EU countries (although some social security expenses beyond the strict health system, such as sick and maternity leave, are also included in that figure). In this fiscally constrained environment, the Croatian health system faces a mismatch among available public resources, growing expenditures, and increasing needs.

7. **Health financing is organized according to social health insurance principles.** A single fund, the Croatian Health Insurance Fund (HZZO), covers the entire population (about 4.4 million beneficiaries comprised by: 1.52 million active workers, 1.05 million pensioners, 1.15 million family members and 0.63 million individuals covered by special programs).

Figure 4: Public Health expenditures



Note: the figure includes what is considered to be public expenditure on health according to current accounting standards. Year 2011.

a. Public Health Expenditures related to health services targeting populations

b. HZZO benefits including seek leave and maternity leave (usually not considered health expenditures in other countries)

8. **The needs that Croatia's health system must address have changed as a consequence of the demographic and epidemiological transition in the country.** The disease burden in Croatia has shifted from being dominated by maternal and child health and communicable diseases to being dominated by chronic and noncommunicable conditions. Heart and blood vessel diseases, for example, are the leading cause of death and account for 49 percent of deaths from all causes; cancer, the second-most-frequent cause, accounts for 26 percent. The two combined are responsible for three of every four deaths.

9. **The institutional structure and capacity of the publicly funded health sector in Croatia has not kept pace with this changing landscape.** Many health care services in Croatia continue to be delivered inefficiently. Hospitals continue to provide services that can be better and more cost-effectively provided in an ambulatory setting. Similarly, LTSC for the elderly is often provided in hospitals (at higher cost and in not adequate environment for the elderly) rather than in nursing homes or assisted living facilities. At the same time, primary care is not acting as an effective gatekeeper, and its role in preventive care needs strengthening.

10. **Increased quality in services and facilities is a core precondition for Croatia to obtain the maximum from available resources.** The Croatian Agency for Quality and Accreditation in Health Care (AQAHS) is an independent and non for profit public institution created in 2010 that acts as the national accreditation service in the Republic of Croatia. AQAHS was established in order to support implementation of the technical regulations which has been harmonized with the *acquis communautaire* of the European Union. Nevertheless, the existing capacity gap in terms of using norms and protocols aligned with best international practice needs to be overcome. Standard practices for more frequent health services are not in place, there is a need to increase secondary prevention to reduce avoidable complications, the surveillance of negative outcomes (sentinel events) is not implemented and quality control mechanisms are not regular practices. A key illustration of this capacity gap is the failure to generate and use disaggregated data, for instance by county, in monitoring and tracking county-level differences in quality and outcomes.²

11. **Croatia has started to implement important health sector reforms to improve efficiency and quality.** Croatia recently introduced a number of long-range reform initiatives, including a new performance-based payment mechanism in hospitals, centralized purchasing for nonmedical equipment and consumables, new wide-ranging governance and management arrangements in health care institutions, and new regulations rationalizing pharmaceutical expenditures (which have been identified as regional best practice in a multi-country study conducted by the World Bank³). Complementary and private insurance have also been implemented. As a result of reforms, the Croatian health system now has better regional balance in terms of funding and human resources.

12. **Pharmaceutical sector reforms in Croatia have expanded access, while the recently launched centralized procurements have reduced costs.** The number of prescriptions in Croatia increased by 69.3 percent between 2005 and 2011, indicating an expansion in access. The Ministry of Health has introduced new regulations promoting the procurement of generics and centralizing procurement using competitive tendering and framework contracts for county hospitals. These reforms have already begun to yield savings; as a direct result of the first round of tenders in 2012, the estimated cost savings have been HRK 187 million (approximately US\$30 million). At the same time, the average expenditure per insured individual and the average expenditure per issued prescription have decreased.

² Although these data are collected, they are not analyzed to support management or oversight, and in fact the current World-Bank-supported project is building capacity for analysis. Reporting by county in Croatia should be ready by December 2013.

³ World Bank. 2013a. "Getting Better: Improving Health System Outcomes in Europe and Central Asia." World Bank, Washington, DC.

13. **There is still ample scope to optimize hospital capacity in Croatia.** The average length of hospital stay across different types of hospitals in Croatia was 9 days in 2011, slightly over the EU average of 8 days. However, the difference increases when new EU members are removed and the comparison is made with the traditional “EU15” countries (around 4.5 days in Norway and Sweden, around 5.5 in France and the Netherlands, around 6.5 in Spain and the United Kingdom). True, this indicator does not present a clear picture of the situation in hospitals in Croatia because it averages the length of stay across very different groups of inpatients—those who should ideally be treated in an ambulatory setting, those who should be cared for in nursing homes or assisted living facilities, and those who should, indeed, be treated as hospital inpatients.

Strategic relevance and technical soundness of the proposed Program

14. **The objective of the proposed Program**—that is, improving health sector quality and efficiency—is critical to the development and EU integration agenda in Croatia. Although the Croatian health system produces fairly good outcomes, this has been achieved at costs that are difficult to sustain in a fiscally constrained environment. The Croatian economy has been in recession for the last few years and the prognosis remains one of limited growth. Overall health spending is high at approximately 7.8 percent of GDP, and Croatia spends significantly more than countries with similar GDP per capita in the region, while the health sector’s share of public expenditures is higher than the average for all EU countries. At the same time, an aging population, shifts in the disease burden toward a dominance of chronic and non-communicable conditions, and the inevitable upward pressure on health care costs from technological advances imply that health expenditures will continue to increase in the future.

15. **The Government of Croatia’s National Health Care Strategy sets out development directions for the health sector and is the framework for making policy and operational decisions, including the distribution of budgetary resources.** The Croatian health care system is primarily determined by the Health Care Act, which forms the fundamental framework of the National Health Care Strategy 2012–2020. This Strategy is the umbrella document determining the context, vision, priorities, and goals for health care in the Republic of Croatia over this period. Croatia became an EU member in July 2013, so the Strategy is also oriented to planning the development of health care in the context of the social, legal, and economic framework of the EU. More specifically, the Strategy takes into account (a) Europe 2020, the EU strategy for growth; (b) Health 2020, the new health policy of the World Health Organization European Region; and (c) the Common Strategic Framework 2014–2020, which forms the basis for financing from EU funds.

16. **The National Health Care Strategy 2012–2020 identifies the strategic problems and reform priorities for the health care sector.** The strategic problems identified are: (a) poor connectivity and insufficient continuity of health care across levels in the health system; (b) uneven or unknown quality of care; (c) inadequate efficiency and effectiveness of the health care system; (d) poor or uneven availability of health care across regions; and (e) relatively poor health indicators, particularly those related to risk factors and health behaviors.

The National Health Care Strategy identifies the following eight main Strategic Priorities:

- (i) **Developing a Health Information System and eHealth.** With a focus on: a) establish an electronic health record for patients, b) increase the use of health care and statistical information to support decision making, and establishing the reporting and warning system, c) generate a functional improvement, modernization and maintenance of the existing information systems in health care, d) increase standardization and certification, e) change management and training, and f) introduce new legal regulations for the sector (estimated EUR 45M).
- (ii) **Strengthening and better using human resources in health care.** Developing a strategic plan of human resources development, strengthening protection of health care workers, introducing vertical and horizontal mobility, improving specialization planning and approvals, adjusting regulations for work after mandatory retirement age (estimated EUR 12M).
- (iii) **Strengthening management capacity in health care.** The specific areas of focus include education and differentiation of management, data analysis, planning and researching the health care system, and strengthening the management authority of community health centers (estimated EUR 14M).
- (iv) **Reorganizing the structure and activities of health care institutions.** Improving integration and cooperation in primary health care and public health, developing and implementing a hospital master plan to rationalize and modernize hospital services, increasing the continuity of care between hospital and out-of-hospital services, structural modifications to hospitals, and increasing centralized (joint) procurement for hospitals (estimated EUR 260M).
- (v) **Fostering quality** in health care through (a) improving quality of monitoring, health worker education, and better public information for users; (b) developing, implementing, and monitoring clinical guidelines and accreditation; (c) introducing performance-based contracting and performance-based payments, with a specific emphasis on pay-for-quality initiatives; and (d) developing and implementing a formal Health Technology Assessment (HTA), including strengthening capacity to implement HTA (estimated EUR 40M).
- (vi) **Strengthening preventive activities** by increasing the budgetary share of preventive activities in the health budget, improving management of preventive activities and programs including the introduction of performance-based contracting for prevention and strengthening preventive care at the primary care level; strengthening systems to monitor harmful environmental factors and early warning/response systems (estimated EUR 24M).
- (vii) **Preserving financial stability of health care** by focusing on strengthening the voluntary health insurance market, improving financial discipline in the health care system through greater accountability, improving the strategic allocation of health resources, and reducing corruption and informal payments (estimated EUR 10M).

(viii) **Improving cooperation with other sectors and society in general** by Strengthening intersectoral cooperation (among ministries), with local and regional self-government and with civil society and media (estimated EUR 4M).

17. The estimated total cost of implementing the 8 year strategy is about HRK 3.1B (EUR 409 M) (table 2) or HRK 390 M (EUR 51 M) per year, 1.6 percent of overall public health sector spending. The cost is mainly related to investments needed for restructuring the configuration of the health facility networks but also to the cost of introducing quality standards, quality control mechanisms, improve management and critical tools to increase the sector governance among other. Benefits from these investments will come directly as in the case of centralized procurement that will reduce the costs of medical supplies and medical devices, of providing more cost efficient health services (ambulatory procedures) or indirectly through increasing quality and reducing readmissions or unfavorable evolution of health conditions and eventually the cost for sick leaves (figure 4)

Table 2. Government Program 2012–2020 (EUR Million)

	2012-2017	2018-2020	2012-2020
1. Developing a Health Information System and eHealth	30	15	45
2. Strengthening and better using human resources in health care	7	5	12
3. Strengthening management capacity in health care	10	4	14
4. Reorganizing the structure and activities of health care institutions	125	135	260
5. Fostering quality in health care	25	15	40
6. Strengthening preventive activities	14	10	24
7. Preserving financial stability of health care	6	4	10
8. Improving cooperation with other sectors and society in general	2	2	4
Sub-total Strategies 3 , 4, 5, 6 and 7 between 2013-2017	180		
Total	219	190	409

The Program

18. The proposed Program to be supported by the Bank would cover 5 out of the 8 priorities defined in the Government’s National Health Care Strategy (2012-20) (the Government program), within the boundaries defined in terms of (a) Program duration; (b) Priorities supported; (c) Institutions involved. .

(a) ***Program duration.*** Program implementation period is from 2013 to 2017.

(b) ***Priorities supported.*** To improve two critical areas of the health services (quality and efficiency) and considering the objectives **and** pillars of the CPS it was agreed with the Government that the Program would include 5 out of the 8 priorities of the National Health Care Strategy 2012–2020 that are oriented to addressing the main reform challenges facing

the Croatian health sector, that is, rationalizing the health facility network, improving quality of health care services, and promoting financial sustainability of the health sector. These include:

Priority iii (Strengthening management capacity in health care) and **Priority iv** (Reorganizing the structure and activities of health care institutions), including: Implementing hospital master plan, Implementing hospital reforms and governance and management changes, promoting group practices for general practitioners, expanding secondary-level ambulatory services, including high-resolution ambulatory centers, redefining long-term health care services and palliative care

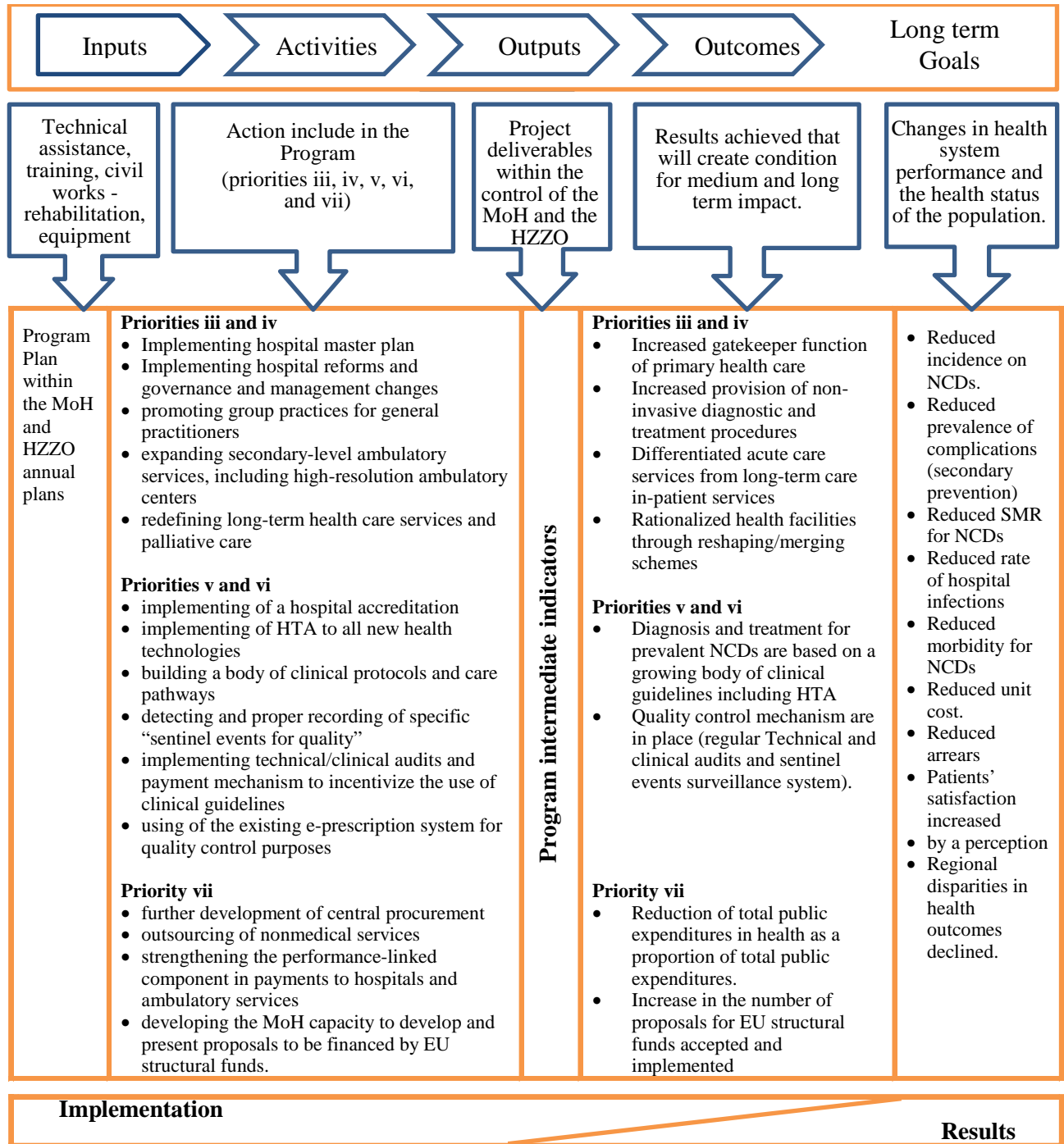
Priority v (Fostering quality in health care) and **Priority vi** (Strengthening preventive activities), including: implementing of a hospital accreditation, implementing of HTA to all new health technologies, building a body of clinical protocols and care pathways, detecting and proper recording of specific “sentinel events for quality”, implementing technical/clinical audits and payment mechanism to incentivize the use of clinical guidelines, using of the existing e-prescription system for quality control purposes.

Priority vii (Preserving financial stability of health care), including: further development of central procurement, outsourcing of nonmedical services, strengthening the performance-linked component in payments to hospitals and ambulatory services, developing the MoH capacity to develop and present proposals to be financed by EU structural funds.

- (c) *Institutions involved.* Three main institutions will be involved in the implementation of the Program. The **Ministry of Health** will have the leading role in terms of defining policies and implementing the strategies but also because most of the Hospitals were re-centralized (under managerial authority of the Ministry of Health) as an initial step to implement the Hospital Master Plan. The **Croatian Health Insurance Fund (HZZO)** will also have a significant role because several of the planned interventions will need its support and involvement. Finally the **Agency for Quality and Accreditation in Health Care and Social Welfare** would have a role in the accreditation process and in the implementation of the technical audits.

19. These 5 priorities are the backbone for a comprehensive health sector reform as presented in figure1.1

Figure 1.1 Program results chain



20. **The proposed Program has many of the critical building blocks required for delivering results.** These include:

- Strong political commitment to achieving reform, which is bolstered by the PforR instrument.
- The Program is harmonized with the larger policy framework for health sector reform in Croatia, since it contributes to the main challenges identified in the Government Program 2012–2020
- The Program is technically sound and oriented to addressing the reform priorities facing the Croatian health sector, that is, rationalizing the health facility network, improving quality of health care services, and promoting financial sustainability of the health sector.
- Clearly defined interventions, which are technically appropriate to improving efficiency and quality in the Croatian context, and are supported by emerging international experience in the area
- An agreed set of SMART (Specific, Measurable, Attainable, Relevant, and Time-bound) results indicators to assess Program performance.

21. Political commitment to the proposed reforms is high, and the Government has already initiated important reforms that seek to improve efficiency and quality, including those that will contribute to the proposed Disbursement-Linked Indicators (DLIs). As a result of reforms, the Croatian health system now has better regional balance in terms of funding and human resources, complementary and, to a limited extent, private insurance has been introduced, a new performance-based payment mechanism has been implemented in hospitals, and new regulations have rationalized pharmaceutical expenditures. The recent reforms in pharmaceuticals are, in fact, identified as regional best practice in a multi-country study conducted by the World Bank.⁴ More recently, the MoH recentralized management of hospitals to implement hospital management reforms that will facilitate future implementation of hospital rationalization.

22. The PforR instrument will further strengthen the internal momentum to achieve results by aligning incentives to support results within the government’s own program and by aligning the incentives of the Ministries of Health and Finance to achieve defined program results. By strengthening country systems, the PforR would also enable Croatia to leverage funding from the EU, an important future source of health sector funding. Institutional arrangements between the MoH and the MoF would enable the MoH to receive in its budget US\$ 10 million to finance Technical Assistance, which will be instrumental in leveraging future funding from the EU.

23. Reorienting service delivery in Croatia is critical to meet the changed landscape of needs effectively and efficiently. The needs that Croatia’s health system must address have changed as a consequence of the demographic and epidemiological transition in the country, in line with what is occurring at world level; the top three underlying causes of disease in 1990 were low body weight in children, indoor air pollution from cooking fuels, and smoking; in 2010 they were high blood pressure, smoking and alcohol consumption (inactivity and poor diet, i.e. eating too little fruit and too much salt, in particular, were responsible for 10% of DALYS). In 1990 NCDs caused 43% of DALYS whereas in 2010 they accounted for 54% of them; in 1990 deaths

⁴ World Bank. 2013a. “Getting Better: Improving Health System Outcomes in Europe and Central Asia.” World Bank, Washington, DC.

related with the Millennium Development Goals accounted for 47% of total DALYS; by 2010, only for 35% (deaths caused by diarrhoea, respiratory infections and measles all fell); DALYS caused by injuries (road accidents, violence, etc) were up – from 10% to 11%⁵. The situation at the moment affects not only rich countries anymore as it can be seen in figure 5.

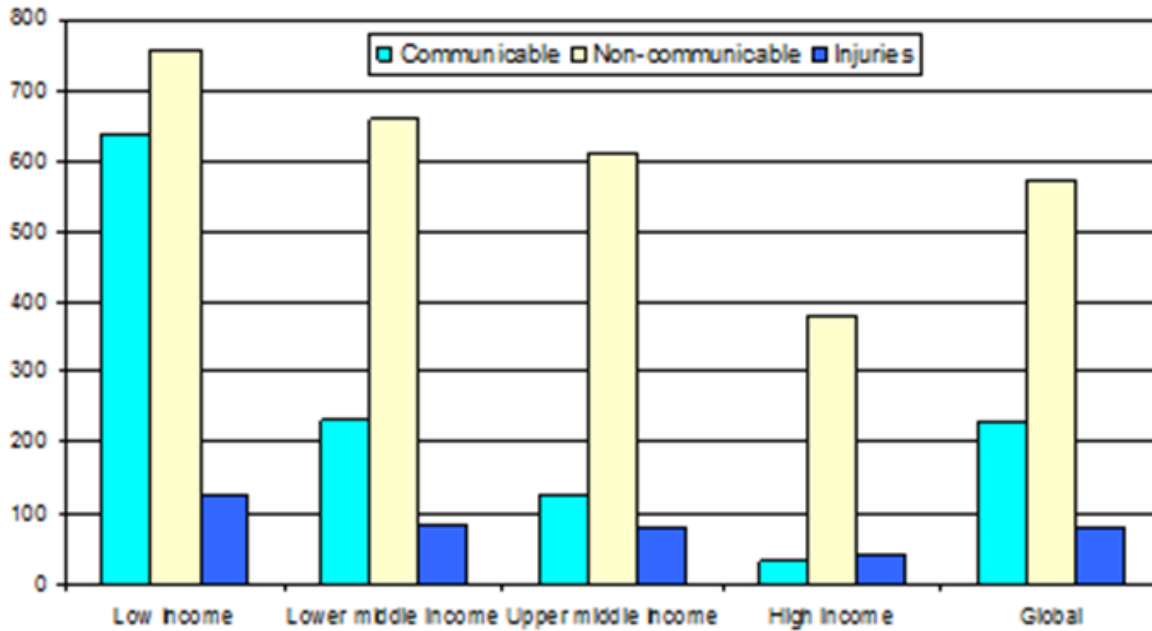
24. The disease burden in Croatia has also shifted from being dominated by maternal and child health and communicable diseases to a majority of chronic and non-communicable conditions. Heart and blood vessel diseases, for example, are the leading cause of death and account for 49 percent of deaths from all causes. Cancer, the second-most-frequent cause, accounts for 26 percent. Combined, the two are responsible for three out of every four deaths.⁶ The underlying causes of disease have also drastically changed.⁷ In 1990, the three leading risk factors were low body weight in children, indoor air pollution from cooking fuels, and smoking, whereas by 2010 they were high blood pressure, alcohol consumption, and smoking; and inactivity and poor diet; eating too little fruit and too much salt accounted for 10 percent of disability-adjusted life years (DALYS).

⁵ The Lancet, 2012, A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990—2010: a systematic analysis for the Global Burden of Disease Study 2010, Volume 380, Issue 9859, Pages 2224 - 2260, 15 December 2012, doi:10.1016/S0140-6736(12)61766-8

⁶ Institute for Health Metrics and Evaluation. 2013. “Global Burden of Disease Croatia, Country Profiles” (accessed May 30, 2013), <http://www.healthmetricsandevaluation.org/sites/default/files/country-profiles/GBD%20Country%20Report%20-%20Croatia.pdf>.

⁷ *Lancet*. 2012. “A Comparative Risk Assessment of Burden of Disease and Injury Attributable to 67 Risk Factors and Risk Factor Clusters in 21 Regions, 1990—2010: A Systematic Analysis for the Global Burden of Disease Study 2010. 380 (9859) (December 15): 2224–60. doi:10.1016/S0140-6736(12)61766-8.

Figure 5. Cause-specific mortality per 100,000 population by World Bank income groups



Source: World Health Statistics 2013. World Health Organization. <http://www.who.int/whosis/whosis/whostat/whostat2013/en/index.html> Accessed on June 2013

25. Due to increased life expectancy the number of patients with more than one disease has increased; people now live longer but they concentrate their diseases at the end of their lives (“compression of morbidity”⁸) so there is less disability but more health problem, which “should not” be treated in one place alone. The service modalities available to many people with long-term conditions, however, are inadequate as they are characterized by their high dependency on acute care, their singularly clinical focus, their reactive character, their fragmented and sporadic nature, their lack of emphasis on personal experience and the residual character of community services and secondary prevention⁹.

26. Meeting these needs effectively and efficiently requires a modern, integrated, patient-centered health system. Chronic conditions pose a thorny challenge to health systems because they depend critically on patient lifestyles and knowledge, require continuous monitoring and management rather than episodic attention, and their management is complex and requires multidisciplinary teams at a moment when many changes are occurring in the way services are delivered: many specialized treatments (prostheses of the joints, dialysis) not exclusively hospital treatments anymore, technologies are now transportable, which challenges their concentration in one single place, better anesthesia and less invasive surgery allows earlier patient recovery; there

⁸ Fries, JF, 1980, Aging, natural death, and the compression of morbidity, *NEJM*, Vol. 303 July 17, Nr 3

⁹ Wilson T, Buck D and Ham C, 2005, Rising to the challenge: will the NHS support people with long term conditions? (Review), *British Medical Journal* 330 (7492): 657-661

are many pharmaceutical and biochemical progress against diabetes (blood sugar measurement, insulin pump,), mental disease (major tranquilizers) and cancer (oral chemotherapy), etc.

27. Traditional hospitals and Primary Health Care are increasingly viewed as outdated and unable to efficiently deliver the needed services tailored to these needs. Traditional hospitals have been criticized because they are organized in silos based on clinical disciplines¹⁰ (...while patients have each time a bigger number of simultaneous problems), they are oriented to providing episodic treatments (while many patients suffer chronic conditions), and they operate with batches and queues and with the difficult-to-understand full-time work schedules of less than 40 hours per week. Traditional primary health care (PHC), originally designed to be supported by basic technology, is also criticized for its limitations in providing access to more modern solutions.¹¹ Increasingly, individuals present with complex comorbidities that challenge the traditional model of PHC service delivery and necessitate access to modern technologies. There are also specific problems with service coordination¹². Although there is a paucity of data that provide a basis for estimating the size of the problem or clarifying the underlying reasons for inadequate coordination, it is understood that possible reasons for problems with the coordination of care include that hospitals and primary care have different administrative and financial structures as well as cultures and other regulations; barriers to good communication; and a lack of leadership to promote collaboration. Uncoordinated care can affect the quality and efficiency of health care, access to care, participation in and satisfaction with care, and health outcomes for chronically ill patients.

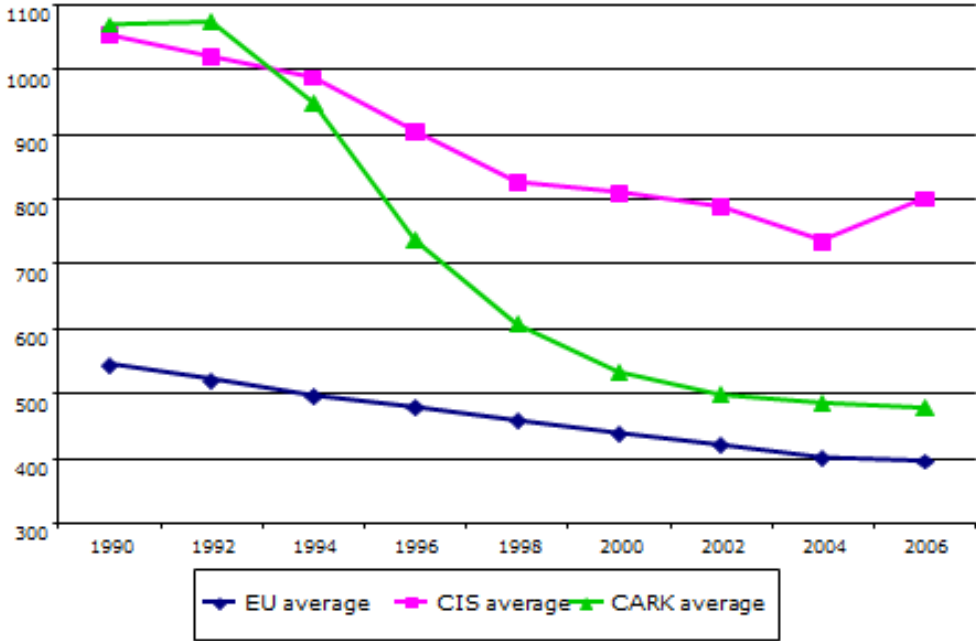
28. Access to first-line technologies could be improved by promoting GP group practices, while access to more complex technologies are more appropriate at the secondary level of care. Moreover, to meet changing health needs, traditional PHC needs to be reoriented from episodic case management to a focus on risk factors and more integrated and comprehensive case management. Therefore, to meet changing demands most efficiently and effectively, modern health systems must be structurally reoriented and rationalized. Many European countries are drastically reducing their bed stocks and the number of procedures applied under conditions of daycare (e.g. cataract removal) are increasing exponentially in recent years (Figure 6 and 7).

¹⁰ O'Connell, T., D. I. Ben-Tovim, B. C. McCaughan, M. G. Szwarcbord, and K. M. McGrath. 2008. "Health Services under Siege: The Case for Clinical Process Redesign." *Medical Journal of Australia* 17 (6 Suppl.): 9-13.

¹¹ WHO (World Health Organization). 2008. "The World Health Report 2008: Primary Health Care, Now more than Ever." World Health Organization, Geneva.

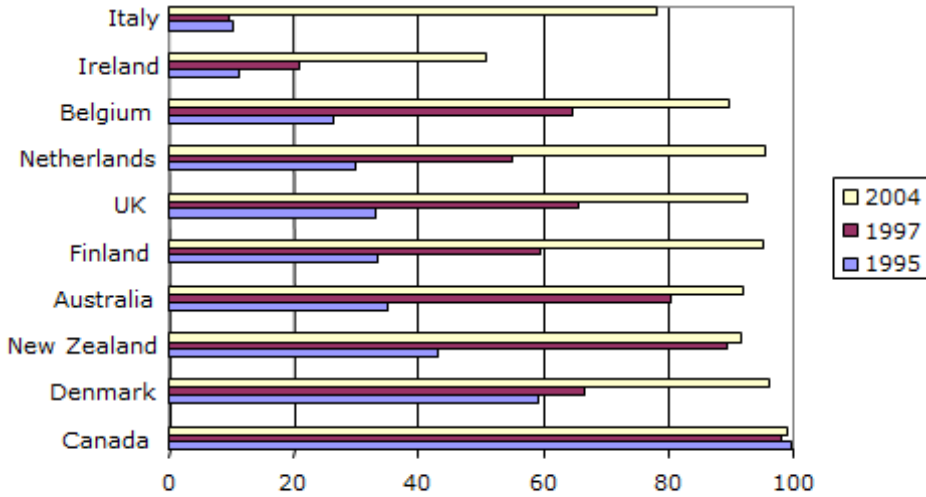
¹² Oxman AD, Bjørndal A, Flottorp SA, Lewin S, Lindahl AK, 2008, Integrated Health Care for People with Chronic Condition, *A Policy Brief*, Norwegian Knowledge Centre for the Health Services, Oslo, 5-7

Acute hospital beds per 100.000 inhabitants, WHO European Region, 1990-2006



WHO EURO, 2010, HFA database

Percentage of Cataract Extractions Performed as Day Cases 1995, 1997 and 2004



Sources: OECD Health Data 2008, International Association of Ambulatory Surgery and OECD Health Data 1998

29. In a way, this is leading to the concept of “Hospital without clear boundaries”¹³, with a critical core of facilities with undisputedly acute services only, including Intensive Care and

¹³ Braithwaite et al. 1995. *Hospitals: to the next millennium*. International Journal of Health Planning and Management. Vol, 10. 87-98.

higher number of operations theaters and emergency units, all linked through information technology, plus many outsourced services (IT, early discharge, home care, catering, medi-hotel), and more ambulatory surgery, and less acute beds.

30. In Germany, a number of newly establishes hospitals have proved able to combine a capital investment threefold higher than in traditional German hospitals, returned through more intensive production and higher profits. This has required a compact and flexible building concept, with integration between the building and the primary process -“every metre a nurse walks unnecessarily costs money”, so nursing departments do not follow medical disciplines but are instead organized according to the level of nursing care -intensive, high, medium and low; and a strong systematization of care processes through the use of care pathways: patients are moved through the different departments, as their condition improves.¹⁴

31. The change is far from restricted to Europe. In the US, the Transformation of Health Care was summarized in table 2 15:

Table 2. Transformation of Health Care System

Old View	New View
1. Emphasis on acute inpatient care	<i>1. Emphasis on the continuum of care</i>
2. Emphasis on treating illness	<i>2. Emphasis on maintaining and promoting wellness</i>
3. Responsible for individual patients	<i>3. Accountable for health of defined populations</i>
4. Emphasis on tangible physical assets	<i>4. Emphasis on intangible knowledge /relationship-based assets</i>
5. All providers are essentially similar	<i>5. Differentiation based on ability to add value</i>
6. Success achieved by increasing market share of inpatient admissions	<i>6. Success achieved by keeping people well</i>
7. Goal is to fill beds	<i>7. Goal is to provide care at the most appropriate level</i>
8. Hospitals, physicians, and health plans are separated	<i>8. Virtual and/or vertically integrated delivery systems</i>
9. Care provided by autonomous health professionals	<i>9. Care provided by health care teams working together in collaboration</i>

¹⁴ Bjørberg S and Verweij M, 2009, Life-cycle economics: cost, functionality and adaptability, in Rechel B, Wright S, Edwards N, Dowdeswell M and McKee M, 2009, Investing in Hospitals of the Future, European Observatory on Health Systems and Policies, Brussels

¹⁵ Shortell, S.M. and A.D. Kaluzny. 2006, Health Care Management: Organization Design and Behavior, p. 10

10. Information is a record for health professionals use	<i>10. Information is a dynamic means for sharing knowledge with patients for their use</i>
11. Managers run an organization	<i>11. Managers provide leadership for improving the value of services delivered</i>
12. Managers coordinate services	<i>12. Managers actively pursue cont. improvement of quality and individual and community health</i>

32. More recently, US hospitals and clinics have been forming into large conglomerates, and physicians have been flocking to join them. Doctors have decided to become employees, and health systems have become chains. According to the Bureau of Labor Statistics, only 25% of doctors are self-employed—an extraordinary turnabout from a decade ago, when a majority were independent¹⁶.

33. International overall response is occurring along several lines (not necessarily opposed with one another)¹⁷ where the health service network is emerging as a possible solution

A. Adjusting facility structure/ functioning

- a.1. Substituting services
- a.2. Creating hybrids
- a.3. Super-specializing in efficiency
- a.4. Super-specializing in complexity

B. Re-articulating the health system

- b.1. Expanding/adjusting institutional boundaries (“networks”)
- b.2. “Disease management”
- b.3. Putting Primary Health Care at the driver’s seat
- b.4. Increasing patient choice

34. International experience indicates that some of the key features required to cope with the disease burden in Croatia are:

- (i) Effective primary care services that play an important part in early detection, prevention, and health promotion managing the bulk of routine conditions and acting as an effective gatekeeper in patient access to referral care;
- (ii) Expanded secondary specialized services to introduce high-resolution ambulatory diagnostic and treatment schemes for higher-volume, lower-cost specialized services

¹⁶ Gawande, Atul, 2012, Big Med, Annals of Health Care, The New Yorker, August 13,
http://www.newyorker.com/reporting/2012/08/13/120813fa_fact_gawande#ixzz2BRprESZy
http://www.newyorker.com/reporting/2012/08/13/120813fa_fact_gawande#ixzz2BRogMvrF

¹⁷ Técnicas de Salud, 2012, Hospitals Of The Future; Systematic Literature Review, Andlaussian School of Public Health and Pan American Health Organization, January 2012

including ambulatory surgeries, day care, and specialized care for non-severe complications of chronic conditions;

- (iii) Rationalized inpatient services, which reduce the focus on an inpatient regime, increase the use of cost-effective interventions, and improve quality of care with the best mix of technology and human resources inputs, and which differentiate general hospital “secondary” services from “true tertiary care” high-complexity hospitals as necessary;
- (iv) Palliative care for terminally ill patients and long-term health care for rehabilitation; and
- (v) Nonhospital facilities to provide long-term social care (LTSC) for the elderly and other groups in need of such care.

35. Rationalizing the health facility network is a key priority in Croatia. The institutional structure and capacity of the publicly funded health sector in Croatia continues to be organized around an outdated model of care, and services are delivered in an inefficient way. Hospitals continue to provide services that can be better and more cost-effectively provided in an ambulatory setting. Moreover, LTSC for the elderly is provided in hospitals, while LTC can be better and more cost-effectively delivered in nursing homes or assisted living facilities. At the same time, primary care is not acting as an effective gatekeeper, and its role in preventive care needs strengthening. The structure of the health facility network is no longer appropriate for the demographic profile of the population, and it is not organized to address co-morbidities, focus on risk factors effectively, or reflect citizen preferences. Governance capacity to effectively manage a modern health system is also scarce, a concern recognized by the MoH in the National Health Care Strategy 2012–2020. A key illustration of this capacity gap is the failure to generate and use disaggregated data, for instance, by county, in monitoring and tracking county-level differences in quality and outcomes.¹⁸

36. The proposed Program appropriately recognizes that the hospital sector is vital to the efficiency and cost control agenda in Croatia. Hospital expenditures continued to increase in Croatia between 2005 and 2011. At 47 percent, hospitals account for the largest proportion of public expenditures on health. This is so despite payment reforms to control increasing costs, such as the introduction of Prospective Payment per Therapeutic Procedure in 2006, Diagnosis Related Groups (DRGs) in 2009, and prospectively defined annual caps on payment. The DRG system has increased efficiency by reducing the length of hospital stays for some evaluated groups. Yet, as mandatory health insurance fund’s expenditures on hospital care were still increasing, it is clear that further efforts are needed. Incentives in payment methods to hospitals also need to be revised to increase efficiency. Currently, the Health Insurance Fund reimburses hospital services that should be provided in an LTC setting, those that should be provided as ambulatory services, and “true” inpatient services in the same way, which reinforces inefficiencies and indicates the potential for future savings. To illustrate, a recent analysis commissioned by the World Bank found that only 1.8 percent of surgeries that should ideally be performed as specialized ambulatory services¹⁹ were delivered in this manner. The remaining

¹⁸ Although these data are collected, they are not analyzed to support management or oversight and, in fact, the current World-Bank supported project is building capacity for analysis. Reporting by county in Croatia should be ready by December 2013.

¹⁹ The surgeries assessed were cataract surgery, testicular surgery, and surgeries for varicose veins, inguinal/femoral hernia, anus (hemorrhoids), removal of osteosynthetic material, and tonsillectomy.

98.2 percent were delivered in a traditional inpatient setting with concomitant higher costs (and higher bills for the public payer).

37. Introducing performance-based payments in primary care and implementing clinical care pathways is critical to reduce referral rates from primary care to higher levels of the health system and improve both quality and efficiency of health services. High referral rates in primary care in Croatia also contribute to low efficiency and higher health costs. Gatekeeping in Primary Health Care (PHC) is intended to act as a filter and to control patient flows into secondary-level care (with the exception of emergency care). When PHC plays this gatekeeping function and is combined with capitation-based payments—such as in Denmark, Ireland, Italy, the Netherlands, Portugal, Spain, and the UK—it can be a potentially effective approach to controlling costs. There is a clear need to strengthen the gatekeeper function of primary care. Referral rates in Croatia are 25 percent—whereas referral rates from robust primary care typically vary between 5 and 12 percent in different health systems, although there are no uniform standards.²⁰ The incentives inherent in provider payment systems in Croatia contribute to this. Although some payments to primary care providers are linked to services, the main payment mechanism is capitation, which incentivizes providers to refer cases. Furthermore, there are no updated care pathways defining the scope and role of primary care services in implementing clinical guidelines. The Croatian National Health Care Strategy 2012–2020 states that group practices are important because they provide opportunities for integrating primary health care services with greater efficiency. Continuity of services and quality of work can be improved by sharing space, equipment (diagnostic and treatment), nonmedical services, organization of standby duties and replacements, planning and implementing additional preventive and curative programs (vaccination, home visits, and so forth), and possibilities of sharing professional consultations and clinical expertise among the partners. HZZO also has a direct interest in promoting establishments of group practices since the monitoring costs are lower than for individual offices. Consequently, the HZZO has recently started to provide financial incentives for primary health care teams to establish group practices.

38. Quality improvement in Croatia is one of the most promising areas of improvement. Health data are not analyzed or disaggregated at the local level. The only available data to probe for local variations in quality are those from the civil registration system. In itself, this is an indication that a focus on quality improvement is needed. The data available from civil registration show regional disparities in infant mortality among counties in Croatia, indicating regional inequities and underlying variations in quality that need to be further investigated. Finally, strengthening the emphasis on preventive care and promoting healthy lifestyles can help to reduce costs associated with non-communicable diseases (NCDs) by preventing both disease and complications thereto. The Program proposes to strengthen the quality improvement agenda primarily by incentivizing the introduction of clinical care pathways based on evidence-based guidelines and disease management protocols. Routine technical audits (that is, audits that seek to assess adherence to protocols) with payments linked to protocols will incentivize improvements in quality of care for both primary care and higher-level services.

²⁰ Sweeney B (1994) The referral system, *BMJ* 1994;309:1180-1181L

39. Health Technology Assessment (HTA), in particular, can improve efficiency of resource use and contain costs.²¹ Experience from countries with mature health systems in Europe and elsewhere indicates that introducing HTA can be a good tool to increase quality and the efficiency of resource use, and contain costs by basing decisions on public subsidies for new technologies using a systematic and transparent appraisal and deliberation process that considers efficacy, cost-effectiveness, and other criteria. In Croatia, the continuous implementation of HTA is critical to capture quality and efficiency gains, and implementing HTA along with centralized procurement through framework agreements will increase the efficiency of resource use, contain costs, and improve quality of care through evidence-based decision making.

Program's Results Framework and Monitoring Indicators

40. In order to monitor progress toward achieving the PDOs, the Program Results Framework will use three PDO-level Results Indicators, and 14 Intermediate Results Indicators. Some of the PDO and intermediate indicators were selected as 10 Disbursement-Linked Indicators (DLI)

41. Since the Program aims at improvements at the health system level by strengthening its quality, efficiency, and sustainability aspects, the measurement and verification of the progress toward achievement of the Program's objectives will be based on the country's existing monitoring and evaluation systems. Specifically, the HZZO health information systems will be relied upon to collect and provide aggregated reporting of monitoring data related to the HZZO's role in contracting services and monitoring/control of quality of service delivery, such as the total number of contracted acute care beds, performed elective surgeries, and doctors' prescription patterns. While monitoring data for most of the Intermediate Results Indicators would be provided by the HZZO, the MOH, through its Department for the Implementation of International Loans, will provide the necessary system-level data for the three remaining Intermediate Results Indicators, such as public spending made through centralized procurement/framework contracts, implementation of hospital reshaping activities, and data related to establishment of group practices. Given its strategic oversight role, the MoH will ultimately be responsible for monitoring the progress toward achievement of the Program's results and for ensuring timely collection and reporting of monitoring data and provision of necessary verification documents to the World Bank and Ministry of Finance (MoF).

42. The Bank will conduct implementation support missions based on the detailed Implementation Support Plan (Annex 9), whose focus would be on timely implementation of the agreed Program Action Plan (Annex 8), provision of necessary technical support, conduct of fiduciary reviews, and verification of results including physical field visits, where appropriate.

Institutional Arrangements and Capacity

43. The three most critical stakeholders involved in implementing the proposed Program are the MoH, the Croatian Institute for Health Insurance (HZZO), and the Agency for Quality and Accreditation in Health Care and Social Welfare (AQAHs). In the context of the proposed

²¹ European Observatory on Health Systems and Policies. 2008. "Ensuring Value for Money in Health Care: The Role of Health Technology Assessment in the European Union." European Observatory, London"

Program, the MoH is the primary beneficiary that will be responsible for using the funds available through the proposed Program to support the reform and restructuring of Croatian health care system according to priorities and directions defined in the Government Program 2012–2020. The HZZO is the main stakeholder responsible for implementing reforms that will achieve the results targeted by the proposed Program. As the single payer in the mandatory health insurance system, the HZZO has a central role to play in achieving the proposed Program results in terms of collecting data and using contracting (of health facilities/GPs) and monitoring/control/quality supervision mechanisms to implement the desired changes in the health care system (for example, contracting and payment based on Key Performance Indicators and Quality Indicators, stimulating ambulatory surgeries, monitoring prescription patterns, auditing hospitals, and incentivizing GP group practices). The MoH is, however, responsible for supervising HZZO activities and for contributions to HZZO revenues, because mandatory insurance constitutes a part of the State Budget revenue. The MoH is currently also responsible for managing all but one hospital. In the long term, however, once the financial rationalization of hospitals is completed, the MoH will once again decentralize management. Finally, the AQAHS is responsible for supporting the HZZO in ensuring the quality of contracted providers from which the HZZO purchases mandatory health insurance services.

44. The AQAHS is national accreditation body complying with all requirements of the international and European standard for accreditation bodies adopted in the Republic of Croatia as the Croatian Standard HRN EN ISO/IEC 17011: 2005. AQAHS' main contribution in this respect is to facilitate and implement accreditation of health care institutions and ensure standards of quality in service provision. AQAHS activities include:

- Accreditation of calibration laboratories (HRN EN ISO/IEC 17025)
- Accreditation of testing laboratories (HRN EN ISO/IEC 17025)
- Accreditation of medical laboratories (HRN EN ISO 15189)
- Accreditation of certification bodies for products (HRN EN 45011)
- Accreditation of certification bodies for quality management system (HRN EN ISO/IEC 17021)
- Accreditation of certification bodies for environment management system (HRN EN ISO/IEC 17021)
- Accreditation of certification bodies for personnel (HRN EN ISO/IEC 17024)
- Accreditation of inspection bodies (HRN EN ISO/IEC 17020)
- Accreditation of PT providers (HRN EN ISO/IEC 17043)
- Accreditation of GHG verifiers (HRN EN ISO 14065)
- Supervision of the accredited bodies
- Maintenance of e-Register of accredited bodies
- Technical support to the state administration bodies for the implementation of accreditation policies in the conformity assessment areas
- Concluding agreements on recognition of accreditation (MLA and MRA)
- Promotion of accreditation and education about accreditation

45. Institutional capacity in Croatia is high and not a major risk to implementation. However, a key gap in capacity relevant to achieving the proposed Program results is the capacity to develop and apply quality improvement guidelines and protocols. The MoH anticipates using technical assistance to remedy this concern. A second key institutional capacity gap in this context relates to providers' management capacity to respond to incentives and supply-side support provided to improve quality and efficiency under the Government Program. Relatively weak management capacity at the provider level is indicated by the large arrears accumulated by hospitals in Croatia. The MoH is currently addressing this issue by centralizing management control of hospitals in order to improve their financial management and building the necessary management capacity. If long-term management capacity is not built successfully, this could compromise the achievement of proposed Program results.

Program Expenditure Framework analysis.

46. **Estimated costs appear adequate to achieve key Program objectives; nevertheless some of the key investments would require the absorption of EU funds.** While, as mentioned before, the estimated total cost to implement the 8-year Government Program is about EUR 409 M or HRK EUR 51 M per year (or 1.6 percent of overall public health sector spending), some critical interventions (civil works and medical equipment) will require additional funds in order to be implemented. While depending on EU funds create a financing risk for the Government Program (and the proposed Program), the Program itself constitutes an opportunity to help Government fulfilling the ex-ante conditionalities to absorb EU funds.

47. **The initial steps of the Government program have created the needed momentum.** The proposed Program will help finance implementation of the first phase of 5 out of 8 priorities of the Government Program (2012–2020). It will also help the GoC to access resources from the EU funds while supporting the efficient use of these resources. In the absence of an EU operational program earmarked for the health sector, the Program will help promote a shift towards the health sector of EU funds, such as the Regional Development Program. The Program will create conditions to support the MoH in applying (stand alone or jointly with other entities) for EU funds and in properly implementing investments that may be financed out of the EU funds if proposals are awarded.

**Table 3. Program Financing
(EUR Million)**

Source	Amount
GoC	105.0
IBRD	75.0
Total Program Financing	180.0

**Table 4. Estimated profile of Program
expenditures (EUR Million)**

Civil Works	95
Medical equipment and goods	25
Technical Assistance	4
Human resources	8
Services + Operational cost	48
Total	180

48. In addition, the MoF and the MoH have agreed on including in the MoH budget additional resources to finance critical Program activities, in particular those oriented to increase quality control, management and cost efficiency. In parallel, greater efficiency in the health sector

supported by the Program will reduce recurrent hospital arrears and allow the reallocation of resources currently being used to cover these arrears to finance Program activities.

49. Based on the cost benefits analysis presented below, sustainability seems not to be an issue in the short term; nevertheless in the long term the success of the Government Program will result in better health outcomes (greater life expectancy) and a growing demand of health services from an aging population.

Economic Evaluation

Economic rationale for the program

50. Croatia produces relatively good outcomes, but at a cost that is increasingly difficult to sustain in a constrained fiscal environment. The production costs associated with the current service delivery model in Croatia are high, and a reorganization is needed to use limited resources more efficiently. At the same time, technological advances exert an upward pressure on health spending while offering opportunities for efficiency if harnessed appropriately.

51. The contribution rate on wages for mandatory health insurance is not sufficient to fund the health system at the current level of benefits, and this is a part of the impetus for the proposed Program. The contribution rate, which was initially set at 18 percent (in 1993), was reduced steadily over the years and in 2012 reached 13 percent. This level of contribution rate may not be sufficient to fund the health system at the current level of benefits, but higher rates could undermine the competitiveness of the Croatian economy. The reliance on contributions versus other sources of public revenues to fund the system will have to be revisited periodically, since aging increases the pressure on expenditure and is likely to lead to a shrinking of the population that can contribute from salaries.

52. Elements of the current service delivery model that create inefficiencies include the following:

- Referral rates from primary care are high (25 percent), indicating that it does not play the role of an effective gatekeeper via early detection, prevention, and health promotion.
- A lack of high-level ambulatory diagnostic and treatment centers. Services that can be provided as ambulatory services with advances in technology continue to be delivered as inpatient services in Croatia.
- Palliative care for terminally ill patients, long-term health care for rehabilitation, and long-term social care for the elderly and other groups are provided in acute care hospital beds at high cost when they can be delivered more effectively and cheaply in low-cost settings.
- There is fragmentation in service delivery. The increasing incidence of co-morbidities makes coordination of care more important than ever before. Lack of coordination in the Croatian health system creates barriers to timely referrals and also gaps in, and overlapping of, resources.

- The lack of clinical guidelines/care pathways contributes to the current overuse of technology, lack of quality control (technical audits), and missing coordination of care across the health system.
53. Incentives in the payment system exacerbate these inefficiencies.
- Capitation-based payments to primary care providers create incentives to underprovide services and to refer patients in the absence of measures that counteract these incentives.
 - Hospital payments do not include incentives to deliver services on an ambulatory basis, or to improve quality of care.

Cost-effectiveness Analysis

54. Given the wide range and complexity of reforms to be supported by the Program, its economic rationale has been foremost assessed conducting a cost-effectiveness analysis that compares some specific services in the current service delivery model with the new proposed service delivery approaches.

The current situation compared to the situation after achieving Disbursement-Linked Indicators (DLIs) 1 and 4

55. *DLI 1. Reduction in the total number of “acute care beds” as a result of their conversion to “social beds,” “long-term beds,” “day care posts,” or closure.* The aim of DLI 1 is to reduce the production costs associated with service delivery by converting acute care beds into social beds, long-term care beds, or day care posts.

56. *DLI 4. Percentage of all surgeries included in the predefined lists of elective surgeries performed as ambulatory surgeries in the last six months and financially stimulated by HZZO through refined contracting/provider payment mechanism.* DLI 4 supports DLI 1 by incentivizing ambulatory surgeries where these are appropriate.

57. Table 4 displays a list of procedures that are currently performed in Croatia as inpatient surgeries that could be provided as ambulatory services with little delay. Table 5 compares the general current situation in Croatia to the one after the proposed Program’s implementation and provides some evidence on the cost savings from decreasing the number of hospital beds.

**Table 5. Savings in Outpatient Costs Compared to Inpatient Costs
for the Same Procedure, with Evidence**

Source	Country	Procedure(s)	Unit Cost Saving (%)
Babson 1972	UK	Hernia repair and varicose vein surgery	40–44
Prescott et al. 1978	UK	Hernia repair and varicose vein surgery	65
Evans and Robinson 1980	Canada	Paediatric surgery	70
Coe 1981	United States	Hernia repair	65
Flanagan and Bascom 1981	United States	Hernia repair	70
Rockwell 1982	United States	Hernia repair	45
Caldamone and Rabinowitz 1982	United States	Orchidopexy	56
Pineault et al. 1985	Canada	Hernia repair and tubal Ligation	12–26
Heath et al. 1990	UK	Laparoscopy, arthroscopy and cystoscopy	49–68
Arregui et al. 1991	United States	Laparoscopic cholecystectomy	46
Mitchell and Harrow 1994	United States	Hernia repair	36
Kao et al. 1995	United States	Anterior cruciate ligament Repair	58
Mowschenson and Hodin 1995	United States	Thyroidectomy and para-thyroidectomy	30
van den Oever and Debbaut 1996	Belgium	Inguinal hernia repair	43
Zegarra et al. 1997	United States	Laparoscopic cholecystectomy	25
Levy and Mashoof 2000	United States	Open Bankart repair	56
Kumar et al. 2001	UK	Anterior cruciate ligament repair	20–25
Rosen et al. 2001	United States	Laparoscopic cholecystectomy	11
Lemos et al. 2003	Portugal	Laparoscopic sterilization	62.4

Source: European Observatory on Health Systems and Policies. 1993. “Day Surgery: Making it Happen.” Policy Brief, European Observatory on Health Systems and Policies, London.

Table 6. Transforming Inpatient Services into Outpatient Services

Current Situation	After Proposed Program Implementation
<p>The system is focused on inpatient services; patients need to be admitted to receive secondary services. There are very few facilities for specialized outpatient services and secondary ambulatory care (diagnosis and treatment).</p> <p>Large number of hospitals and of acute beds (5.2 beds per 1,000 population in 2012).</p> <p>(EU average = fewer than 4 per 1,000 population.)</p>	<p>At least 60 percent of elective surgeries paid by the HZZO and included in a list of elective surgeries to be performed as ambulatory and day surgery. This includes cataract surgery, knee arthroscopy, surgery of varicose veins, anal surgery (hemorrhoids), carpal syndrome corrective surgery.</p> <p>The number of acute beds reduced by 20 percent from 15,930 acute beds in 2012 to 12,800 beds in 2017.</p>
<p>Evidence:</p> <p>Studies have shown that decreasing the number of hospital beds seems to have increased the cost of hospital care per person treated. However, this cost increase is a consequence of implementing different admission criteria, which emphasize treating more severe cases that will require more complex treatment and for longer periods, (increasing the average number of days of a hospital stay).</p> <p>In addition to the medical and social outcomes, the costs of day care and ambulatory surgery over inpatient surgery are between 25 and 68 percent lower than for the same procedures carried out on an inpatient basis.</p>	

For instance, a World Bank study in Romania.²² estimated that shifting approximately 15,000 beds to long-term and social care would save approximately US\$47.8 million per year, and that closing approximately 30,000 beds would produce savings of about US\$240 million per year. This calculation was based on the following assumptions: (a) there is no change in utilization patterns, only in the number of beds; (b) annual cost per bed equals hospital costs divided by total number of beds; (c) long-term and social care costs per bed are 60 percent cheaper than acute hospital care; and (d) the number of acute care beds is reduced from 130,000 to 100,000.

The current situation compared to the situation after achieving DLIs 2 and 3

58. *DLI 2. At least two substantial “hospital reshaping scheme” subprojects²³ implemented.* The aim of this DLI is to implement two model hospital reshaping schemes to reorient the service delivery infrastructure so that health service delivery is re-profiled to match changing needs and harness technologies for greater cost-efficiency.

59. *DLI 3. Percentage of hospitals that became financially consolidated within the redefined institutional architecture, in line with the Master Plan.* The target number is for two model hospital reshaping schemes to be implemented by the end of the proposed Program, and for 80 percent of hospitals to be financially consolidated by the end of the proposed Program.

60. Table 6 compares the current service delivery infrastructure to the one after the proposed Program’s implementation in a rationalized and modernized hospital services system.

Table 7. Reorienting the Service Delivery Model and Implementing the Hospital Reshaping Schemes

Current Situation	After the Proposed Program’s Implementation
<p>Services that would be delivered more cost-effectively on an ambulatory basis with potentially improved medical and social outcomes for patients are currently delivered as inpatient services in Croatia. Primary care physicians are greatly underutilized. The distortions in health service delivery lead to the underuse of prevention measures and inefficient use of health technology (diagnoses, treatments, and pharmaceuticals). This contributes to the higher production costs associated with service delivery in Croatia.</p>	<p>The initiation of well-designed hospital reshaping schemes is expected to improve this situation. For instance, a “3X (1+1)” scheme would involve three institutions operating as hospitals today that become one substantially more modern hospital plus one full-fledged ambulatory and day care center and a third one that would provide much less complex services at the secondary level. Regional networks are defined which possess differentiated “true tertiary care” hospitals performing as heads of the networks. All the institutions would deal with diseases (e.g., cardiology, radiology, orthopedic surgery, ophthalmology, etc.) that currently experience service bottlenecks and would be provided with the necessary legal status, managerial responsibilities, and budgetary flexibility. These interventions are expected to increase efficiency by reducing waste and creating economies of scale and of reach and by reducing duplication and unnecessary spending. This initiative will also include the development of a framework for the rational</p>

²² World Bank. 2008. “Romania Human Development Program Knowledge Note - Health Sector.” World Bank, Washington, DC.

²³ Hospital reshaping scheme means designing and operationalizing subprojects with substantial adjustment in the way (hospital) services are organized, managed, and funded, and moving forward with the necessary actions in the legal, financial, managerial, and other spheres to initiate, test, and explore deep changes. For example, a “3 X (1+1)” scheme would involve three institutions operating as hospitals today that become one substantially more modern hospital plus one full-fledged “ambulatory and day care center” and a third one that would provide much less complex services.

	<p>organization of health services aimed at increasing the efficiency, and improving the quality, of care provided in the system.</p> <p>The proposed Program would support implementation of two model reshaping schemes. It is anticipated that these models would be implemented across Croatia with support from other sources such as EU structural funds.</p>
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Evidence:

This is a new idea, so there are no evaluations of similar projects from which to learn lessons. However, examples abound at the international level of innovative patterns of care adopted in response to unit cost increases, changes in morbidity profiles, and citizens' expectations.

Many Western European countries have been experimenting for a number of years on emphasizing patient-focused care based on the principles of hospital *reengineering* (by introducing, for example, clinical protocols, integrated patient records, patient grouping, multidisciplinary care teams, cross training, and decentralized decision making). There is now a clear trend in these countries toward reducing the number of hospital beds and transferring services to day care units. This not only has not diminished the health system's ability to cope with the existing workload, but has actually increased output. This was the case in England. The trend continues to the present day and is combined with efforts to provide "integrated care under one roof."

For decades, the Netherlands has had a Bismarckian type of health care system. The number of general hospitals in the Netherlands dropped from about 200 in 1950 to 95 in 2009, including eight academic hospitals and two specialized hospitals. The decline was mainly the result of regional mergers of hospitals to improve the quality of care and/or to ensure their financial survival. Due to consolidations, the average number of beds per general hospital significantly increased from 349 in 1980 to 498 in 2008 (in 2008 the smallest hospital had 138 beds and the largest had 1,368 beds).^a This increase was paralleled by a drop in the total number of general hospital beds from about 60,000 beds in 1980 to approximately 42,350 beds in 2008. Despite this reduction, because the length of hospital stay was significantly shorter, the number of patient days dropped by 41 percent, and hospital production increased (hospital admissions grew by 143 percent) In addition, in 1990, 21 percent of hospital admissions were dealt with in outpatient clinics compared with 46 percent in 2006.

New insurance legislation explicitly authorized health insurers to reimburse the costs of health services provided by "independent treatment centres" that specialized in ophthalmology, dermatology, maternity and child care, orthopaedic surgery, cosmetic surgery, radiology, and cardiology. As a result, the number of these services grew from 31 in 2000 to almost 160 by the end of 2006.^b

The same approach is now the rule in most Western European countries, as attested to by the European Observatory on Health Systems and Policies and the Organisation for Economic Co-operation and Development countries.

Such changes often include the long-anticipated need to design or redesign the physical environment of hospital. This need has been confirmed by research in the Netherlands. The Dutch competition "Future Hospitals: Competitive and Healing," asked researchers: "which functions absolutely need to be in the core hospital building and which functions could be located elsewhere?" The conclusion was that only a little over 50 percent of the traditional floor area is needed, mostly for the "hot" floor^c functions. Other areas such as hotel, factory, and office functions could be located elsewhere (Netherlands Board for Health Care Institutions 2006).

Note:

- a. Maarse, H., and L. Lodewick. 2011. "Governing Public Hospitals." European Observatory on Health Systems and Policies."
- b. Bartholomé, Y., and H. Maarse. 2006). "Health Insurance Reform in the Netherlands." *Eurohealth* 12 (2): 7–9
- c. Hot floor areas are the treatment facilities (excluding hotel/rooms and offices).

The current situation compared to the situation after achieving DLIs 5, 6 and 10

61. *DLI 5. Percentage of rationalized network hospitals, among those contracted by the HZZO and subject to technical audit²⁴ in the previous year, that show best performance against explicit key performance indicators (KPI) and quality indicators (QI) to manage NCDs as*

²⁴ Comparative analysis and benchmarking of hospital performance, based on hospital invoices sent to HZZO, with main results made publicly available

defined by the HZZO and whose main results made publicly available. The aim of DLI 5 is to ensure that the HZZO, as a single payer, along with other public authorities who own health facilities, agree on and hold hospitals accountable to meet key performance standards, including quality-oriented disease management arrangements such as explicit protocols to fight NCDs, through a systematic audit process that is implemented at least once a year.

62. *DLI 6. Percentage of hospitals, among those contracted by the HZZO, that get accredited through a basic MoH-defined but independently run accreditation process.* The aim of DLI 6 is to ensure that all hospitals in Croatia meet minimum standards for service quality and adequacy.

63. *DLI 10. Percentage of hospitals with surgery wards that have established quality- and safety-related sentinel surveillance schemes showing the rates of specific events: (i) avoidable, non-traumatic, diabetes-related lower -limb amputations, (ii) postoperative pulmonary embolism, and (iii) deep vein thrombosis.* DLI 10 aims at establishing sentinel surveillance schemes as a quality control mechanism and component of a modernized health information system.

64. Table 7 compares the situation before the proposed Program’s implementation to the one after and provides evidence on the benefits of introducing a health information system evolving around clinical guidelines and care pathways.

Table 8. Improving Quality through Audits, Accreditation Procedures, and Quality Control Mechanisms

Current Situation	After the Proposed Program’s Implementation
<p>Few clinical guidelines are being used and the sector is not aligned with Croatia’s population needs and resources. This lack of guidelines (or care pathways) means that there is no quality control and leads to an overuse of technology.</p>	<p>The new set of protocols will be used to emphasize equity and ease of access and use of “care pathways.” These protocols and other quality control measures will be enforced through technical audits. While in the short run the additional audits are likely to increase administrative costs, the savings that will accrue will be more than sufficient to finance these audits.</p> <p>In addition, the information system will introduce different algorithms to assess quality, identify overuse or potential fraud situations, and sharpen the focus of the technical audits.</p> <p>Hospitals must pass a MoH-defined accreditation process in order to keep operating. This process enforces the requirement that hospitals actually meet the quality standards measured by key performance indicators (KPI) and quality indicators (QI). As a consequence of this measure, the quality of the hospitals in operation will improve.</p> <p>A sentinel surveillance system will be implemented that reports readmissions, adverse effects, and incidences of preventable specific medical events. Such a surveillance system allows for timely monitoring and investigation of suspected public health problems. It thereby contributes to a better quality of health care in general and complements the measures undertaken to improve the quality of services provided within hospitals.</p>
<p>Evidence: Health economists assert that, to maximize the population’s health status, health services should prioritize the most cost-effective interventions. Clinical guidelines and care pathways based on evidence can give providers advice on which treatments to offer under which circumstances and are therefore ideal tools for promoting cost-effective clinical practice.</p>	

Care pathways are a tool to promote the best possible treatment within an existing level of resources. Several studies have proved that they help improve patient outcomes and the quality of health services, facilitate the continuous training of the human resource in health and reduce inequities.^a While the primary reason for implementing care pathways is improving the quality and increasing the equity of health service delivery and patient outcomes, several studies have shown that they can also reduce length of hospital stays, decrease unnecessary resource use, and increase patient satisfaction.^b How much can be saved by introducing new or updated care pathways varies greatly depending on the health problem. In some cases, a new care pathway can increase costs due to the introduction of a new technology or new drugs, whereas in others (as is the case of Croatia), it will reduce costs by mandating outpatient treatment for health problems that were previously managed on an inpatient basis. However, in all cases, using care pathways will make it possible to carry out technical audits and will keep down the costs of expensive technologies and drugs for which there is little or no evidence supporting their use.

In the countries where care guidelines are regularly used, if a new treatment both improves health outcomes and reduces costs, then clinical guidelines are updated to recommend the new treatment. If the new treatment both reduces health outcomes and increases costs, then no change is introduced and the guideline continues to endorse the standard treatment. However, if the new treatment is both more effective at improving health outcomes but more costly, then policy makers must judge whether the health gains are large enough to justify the additional cost. This is usually done by calculating the incremental cost-effectiveness ratio (ICER) and comparing it with a pre-specified cost-effectiveness threshold. The ICER is the difference between the mean costs of each strategy divided by the difference in mean health outcome (the slope of the line that connects the strategies).

The evaluation of the impact of implementing care pathways is done on a case-by-case basis and is often used to recommend a single drug or a specific surgical procedure or to define a protocol for combining several therapeutic alternatives. These evaluations yield evidence that can be used to continuously revise the guidelines.

Sentinel surveillance. In a sentinel surveillance system, a prearranged sample of reporting sources agrees to report all cases of defined conditions, which might indicate trends in the entire target population. When properly implemented, these systems offer an effective method of using limited resources and enable prompt and flexible monitoring and investigation of suspected public health problems. Examples of sentinel surveillance are networks of private practitioners reporting cases of influenza, laboratory-based sentinel systems reporting cases of certain bacterial infections among children, or pregnant women in prenatal care who report HIV infection in cases of generalized epidemics where HIV is over 1 percent in the general population.^c Sentinel surveillance is excellent for detecting large public health problems, but it may be insensitive to rare events, such as the early emergence of a new disease, because these infections may emerge anywhere in the population.

Note:

- a. <http://www.who.int/hiv/topics/surveillance/2ndgen/en/>. EuSANH: European Science Advisory Network for Health. <http://www.eusanh.eu/about-eusanh>
The Cochrane Collaboration. Evidence-based health care and systematic reviews. <http://www.cochrane.org/about-us/evidence-based-health-care>.
The National Institute for Health and Clinical Excellence (NICE). "The benefits of implementing clinical guidelines." http://www.nice.org.uk/usingguidance/benefitsofimplementation/benefits_of_implementation.jsp.
- b. Turbo, R. (1993). "If this is cookbook medicine, you may like it." *Medical Economics* 1993;70:69–72, 77–78, 80–82.
Lord, J. (1993). "Practical strategies for implementing continuous quality improvement." *Managed Care Quarterly* 1993;1:43–52.
London, J. (1993). "On the right path: collaborative case management makes nurses partners in the care planning process." *Health Progress*. 1993;74:36–38.
- c. World Health Organization. "Second Generation Surveillance for HIV/AIDS,"

The current situation compared to the situation after achieving DLIs 7 and 8

65. *DLI 7. Percentage of doctors for whom HZZO-defined prescription patterns in the last six months were found to be "non-satisfactory" and with whom a corrective course of action was discussed on a person-to-person basis.* The aim of DLI 7 is to ensure that pharmaceutical prescription practices of doctors are monitored by the HZZO and feedback on non-satisfactory

practices discussed with doctors, along with corrective action that doctors will take so that prescription practices improve.

66. *DLI 8. Percentage of total public spending on medical consumables, drugs and devices for hospital (inpatient and outpatient) services made through centralized procurement/framework contracts and disclosed on the Ministry of Health website in simplified and understandable format.* DLI 8 assures that the cost savings potential from centralized procurements is used, and that the centralized procurement is conducted in a transparent way.

67. Table 8. compares the current situation with the one after the proposed Program’s implementation with respect to spending on pharmaceuticals and provides evidence for the successful use of HTAs, generics, and central procurement in controlling costs related to pharmaceuticals.

Table 9. Saving Costs through Prescription Monitoring and Centralized Procurement

Current Situation	After the Proposed Program’s Implementation
<p>A large and rapidly growing proportion of health care expenditure in Croatia is for medicines. The pharmaceutical market in Croatia was valued at €611 million in 2011.^a Pharmaceutical expenditures are increasing faster than GDP and outstripping expenditure growth in other sectors of the health care system.</p> <p>A substantial proportion of the funds at the disposal of the HZZO are spent on pharmaceuticals and expensive drugs (approximately 20 percent of total health expenditure under mandatory health insurance in 2011), which is high compared with other European and former Eastern Bloc countries, and represents a fiscal imbalance in the management of the health budget.</p> <p>The payment system in Croatia does not penalize primary health providers for the prescription of high-cost pharmaceuticals. Consequently, primary care providers do not have sufficient incentives to take into account the costs of their prescriptions and contribute to over-prescription of pharmaceuticals. Little is done to monitor and/or evaluate prescribing or promote rational drug use.</p> <p>The potential for cost savings from centralized procurement and the use of framework contracts has not yet been fully exploited.</p>	<p>Health Technology Assessment (HTA) is a vital input to define the drugs to be prescribed and therefore promotes efficiency of resource use and also helps to contain cost escalation.</p> <p>The pharmaceutical prescription practices of doctors are monitored by the HZZO, and the health information system that is being extended for monitoring prescriptions will give doctors feedback on their prescribing practices and will help reduce prescription fraud and improvident spending. This measure helps to ensure adherence to the recommendations obtained from HTA.</p> <p>The improvement in expenditure efficiency achieved through prescription monitoring is further enhanced by centralized procurement of pharmaceuticals.</p> <p>As a consequence, the total budget expended on pharmaceuticals will reach a peak and remain stable or start to decline.</p>
<p>Evidence:</p> <p>Health Technology Assessment (HTA). Almost all European Member States have experienced exponential growth in the use of health technologies in recent years (new pharmaceuticals, diagnostic procedures, and medical equipment). The National Institute for Health and Clinical Excellence (NICE) in the United Kingdom was the first national attempt to provide faster access to cost-effective treatments through an evidence-based review process.^b Soon afterward, most Western European countries began using HTAs to assess the costs and benefits of introducing each new drug, piece of equipment, or procedure. The cumulative savings from implementing HTAs is difficult to estimate, but there is a huge potential for savings to be made in Croatia. Most HTAs focus their analysis on implementing a specific new guideline. For example, an evaluation of the “Effective Health Care Bulletin” in England that was dedicated to the treatment of the persistent glue ear in children was estimated to have resulted in savings of £27 million in the four years after the new guidelines were published.^c</p> <p>Generic drugs. The economic benefit of increasing the use of generic medicines is obvious; generic drugs</p>	

produce savings of 10 to 90 percent compared with the original patented product depending on the different drugs. Most European countries introduced policies to encourage generic drugs many years ago, with significant differences in the proportion of use from country to country. The use of generic medicines is currently generating some €25 billion in savings each year for EU health care systems.^d

Centralized procurement. In Croatia, the Ministry of Health has already introduced new regulations promoting the procurement of generic drugs and centralizing procurement using competitive tendering and framework contracts for county hospitals. These reforms have already begun to yield savings; as a direct result of the first round of tenders in 2012, the Ministry of Health estimated that cost savings have been HRK 187 million (approximately US\$30 million). At the same time, the average expenditure per insured individual and average expenditure per issued prescription have decreased.

Note

- a. European Federation of Pharmaceutical Industries and Associations. The Pharmaceutical Industry in Figures. Key Data 2013. Downloaded from < http://www.efpia.eu/uploads/Figures_Key_Data_2013.pdf.> on September 26, 2013.
- b. European Observatory 2008. “Ensuring Value for Money in Health Care: The role of health technology assessment in the European Union”
- c. Mason J. (2001). “Impact of Effective Health Care bulletin on treatment of persistent glue ear in children: time series analysis.” British Medical Journal. 2001 November 10; 323(7321): 1096–1097.
- d. European Generic Medicines Association 2011. “The Use of Generic Medicines in Europe.” <http://www.egagenerics.com/gen-geneurope.htm>.

The current situation compared to the situation after achieving DLI 9

31. *DLI 9. Percentage of general practitioners working in group practices.* The aim of DLI 9 is to strengthen the role of primary health care in prevention and health promotion and managing chronic conditions by incentivizing collaboration among groups of practitioners so they have the capacity to expand the delivery of prevention, health promotion, and chronic care management and thereby reduce referrals.

32. Table 9 compares the current role of primary health care to the situation after the proposed Program’s implementation and provides evidence on the benefits from handling the occurrence of NCDs via primary health care.

Table 10. Strengthening the Role of Primary Health Care through GP Group Practices

Current Situation	After the Proposed Program’s Implementation
<p>Primary health care units do not play a strong role in delivering primary and secondary prevention services, or in managing chronic conditions. Referral rates from primary care units to higher levels of the health system are very high.</p> <p>In particular, the incentives inherent in the provider payment systems contribute to the underuse of primary health care services. The main payment mechanism is capitation, which incentivizes primary care providers to simply refer cases. At the same time, the disease burden shifted, and the effective treatment of chronic diseases becomes crucial for the optimum functioning of the Croatian health system. These diseases can be treated efficiently within primary health care institutions.</p> <p>Group practices can increase the capacity of general practitioners (GPs) to deliver primary and secondary prevention services and prevent referrals. The HZZO’s payment rates will be higher for group</p>	<p>A higher use of primary care for preventive services in accordance with clinical guidelines. Group practice will improve capacity to deliver effective primary care services because participating practitioners will bring a wider range of skills to the practice. It will also ensure that the bulk of routine conditions are managed at the primary care level, thus ensuring that primary care practices become gatekeepers for referral care. Only cases identified as complex and that require additional resources to specialty services will be referred.</p>

GP practices than for solo GP practices, thereby incentivizing group practice.	
<p>Evidence: The costs and benefits of primary and secondary prevention have been evaluated in many different ways and with different outcomes depending on what interventions were involved and the prevalence of the health problem. Abundant evidence exists regarding the cost-effectiveness of reducing the prevalence of the four main risk factors for NCD (alcohol abuse, overweight/obesity, lack of physical activity, and tobacco use).^a Several of these interventions are primary prevention through population interventions (such as regulations to reduce tobacco consumption), and many others are secondary prevention that target individuals (such as drugs to reduce cholesterol and triglyceride levels). An increased use of clinical guidelines to treat complications associated with chronic conditions can be cost-effective. In the Netherlands, for example, an update of the clinical guidelines to treat diabetic foot complications resulted in longer life expectancy, gains in quality-adjusted life-years (QALYs), and reduced incidence of foot complications. The lifetime costs of managing diabetic foot complications by following guideline-based care reduced diabetic foot complications, raised survival rates, and yielded a cost per QALY gained of almost US\$25,000 and even cost savings.^b</p>	

Note:

- a. National Institute for Health and Clinical Excellence (NICE) in United Kingdom, Public Health Interventions Cost-effectiveness Database (PHICED), <http://www.crd.york.ac.uk/CMS2Web/>.
- b. Ortegon, M. M., W. K. Redekop, and L. W. Niessen. 2004. "Cost-effectiveness of Prevention and Treatment of the Diabetic Foot: A Markov Analysis." Netherlands Institute of Health Sciences. *Diabetes Care* 27 (4) (April): 901–7..

Cost-benefit analysis

33. **Costs of the Program.** As costs of the Program are considered the investment costs related to achieving the 5 priorities of the National Health Care Strategy 2012-2020 that the Program supports (180 EUR Million from 2012 to 2017, 75 EUR Million of which are from Bank funds, and 168 EUR Million from 2018 to 2020 from government funds).

34. **Benefits of the Program.** As stated in the Program description, the 5 priorities contain an intercorrelated cluster of interventions. Focusing on the 7 key interventions²⁵ listed in the Program description, the derived monetary benefits are the following.

35. The *rationalization of hospital inpatient services* is linked to one of the key results of the Program, namely the reduction of the number of inpatient hospital beds from 15,930 to 12,800 by the end of the first phase of the Program in 2017. The expected savings related to this reduction in hospital beds constitute the first source of monetary benefits considered in this analysis.

36. The beneficial effect of *more effective primary health care services, secondary specialized services, extended palliative* as well as *long-term social care services* on the one hand, and *extended Health Technology Assessments* and *Quality Control mechanisms* on the other hand will be estimated using the impact on population health status measured in terms of Disability Adjusted Life Years

²⁵ Implementing more effective primary health care services, expanding secondary specialized services, rationalizing inpatient services, implementing palliative care/ long-term health care, expanding long-term social care, expanding Health Technology Assessment (HTA), expanding the Quality control mechanisms.

(DALYs), which represent the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability.

37. Expected cost savings due to the extended use of *centralized procurement* are not being taken into account on the benefit side. The government has previously introduced regulations that promote the procurement of generic drugs as well as the use of centralized procurement mechanisms. These results have yielded estimated savings of approximately HRK 187 Million in 2012 (approximately 25 EUR Million), which indicates the huge potential for cost savings from procurement reforms in Croatia. The Program includes interventions aimed at assuring that a higher percentage of public health spending related to procurement is made through centralized procurement and framework contracts, but the benefits from these additional reform interventions are hard to disentangle from previous initiatives. Hence, the (likely considerable) cost savings attributable to further use of centralized procurement are not considered in this cost-benefit analysis.

38. Likewise, the monitoring of doctors' prescription patterns which is part of the Program reforms and the cost savings it generates is not taken into account as a source of benefits in this analysis. The estimation of those benefits considered is based on conservative assumptions.

39. The assumptions used in the cost-benefits analysis are listed below:

- **Basic discount rate.** Financial costs and financial savings are discounted at 3 percent (the average inflation estimated for the 2013-2017 period.²⁶) to account for future inflation. A higher discount rate of 6 percent is also applied to verify the sensitivity of the results to this assumption.
- **Period of time considered.** The cost-benefits of the interventions are calculated over the 2012-2017 period (for which the Bank funds are used) as well as over the 2012-2020 period.
- **Population covered.** In general is assumed that all interventions will be implemented nationwide. Therefore, the interventions will affect health results for the entire population, (around 4.27 million people in 2012) or the efficiency level of all facilities. Population growth up to the year 2020 is based on the WB HNP Statistics.
- **Expected disbursements of investments.** When discounting the financial costs of the Program, it is assumed that the funds provided by the Bank are disbursed according to the estimated disbursement schedule (see Program Financing Data²⁷). All own funds contributed by the government are assumed to have been disbursed upon Program start in 2012 for the sake of a more conservative estimate of the Program's NPV and IRR. Likewise, the additional government funds (168 EUR Million) for the period 2018-2020 are assumed to be completely disbursed in 2018.
- **Benefits of reforms beyond 2020.** Although the benefits from the Program will likely persist beyond Program completion in 2020, benefits beyond the year 2020 are not accounted for in this analysis due to the increasing uncertainty about the counterfactual scenario without the Program and recurrent costs from the Program interventions. This approach assures that the estimated benefits are conservative.

²⁶ Source: IMF. World Economic Outlook, April 2013.

<http://www.imf.org/external/pubs/ft/weo/2012/02/weodata/index.aspx>

²⁷ The 22.5 EUR Million from Bank funds expected to be disbursed in 2008 are considered as financial costs for implementing the first Program phase 2012-2017.

- Due to the intercorrelation of the supported interventions and the P4R nature of the project (making disbursements for a given intervention less related to the actual cost of implementing this particular intervention), the NPV and IRR are only calculated once for the whole package of interventions.

Expected Benefits from the Transformation of Hospital Inpatient to Outpatient Services

40. Table A4.1 states some of the evidence for the empirically well-documented fact that performing a wide array of procedures on an outpatient instead of an inpatient basis leads to considerable cost savings. The Program tries to capitalize on this opportunity for costs savings. PDO indicator 1 is the reduction of the number of hospital beds from 15,930 to 12,800 by 2017. Based on this PDO indicator, the benefits from the transformation of hospital services is considered.

41. The calculation of the benefits from the transformation of inpatient into outpatient services is based on the following additional assumptions:

- There is no change in utilization patterns due to the reforms, only in the number of beds.
- The annual cost per bed equals hospital costs divided by total number of beds.
- Long-term and social care costs per bed are 40 percent cheaper than acute hospital care.²⁸
- All beds are transformed into long-term and social care beds, no bed simply ceases to exist (making the obtained estimates of cost savings yet more conservative).
- The counterfactual in the absence of the Program is that the number of inpatient hospital beds does not change until 2020.

Table 11. Benefits from the Transformation of Hospital Inpatient to Outpatient Services (EUR '000s)

Discount Factor	2012-2017 Benefits from Inpatient Bed Transformation	2018-2020 Benefits from Inpatient Bed Transformation
3%	168,924 EUR	267,938 EUR
6%	159,321 EUR	232,172 EUR

Expected benefits from more effective primary health care services, secondary specialized services, extended palliative as well as long-term social care services, extended Health Technology Assessments, and Quality Control mechanisms

42. The benefits deriving from the above-listed interventions are estimated using the impact on population health status measured in terms of Disability Adjusted Life Years (DALYs) from NCDs. The additional assumptions made in the economic analysis of these interventions are:

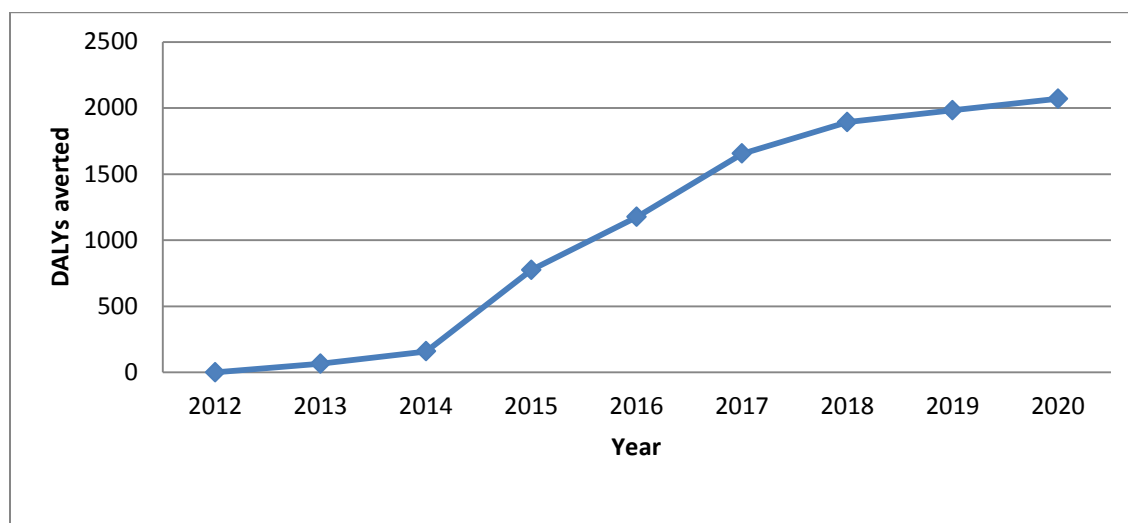
- **Reduction in DALYs:** DALYs, which represent the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability, have a built-in age

²⁸ World Bank. 2008. "Romania Human Development Program Knowledge Note - Health Sector." World Bank, Washington, DC. The evidence in table A4.1 reflects this estimate.

weighting and discount rate of 3 percent. The reduction in DALYs upon Program completion in 2020 from the integrated interventions supported by the Program is conservatively set at 0.3 percent across all NCDs. The reductions in diseases from the interventions of the project (Increased access to high-quality MCH and NCD services) took the conservative values for interventions from the DCP-2.

- **Counterfactual Scenario for DALYs:** The baseline DALYs were calculated for the various conditions from WHO estimates for the Eastern and Central Asia region, adjusted for the population size of the project (4.27 million people) and the age structure of Croatia (from the WB HNP Statistics). These include the forward projections of DALYs averted (that is, healthy life years gained) from 2013 to 2020.
- **Valuation of DALYs** used a very simple rule. Each DALY saved is valued at yearly per capita income (using a starting value of about EUR 10,000 for 2012). The Disease Control Priorities Project and Copenhagen Consensus guidelines mention three times per capita income as a still conservative estimate for the value of each DALY averted.²⁹ Studies of valuation of life in the United States even utilize much higher values for a year of life that would produce more extreme results.
- **Discount Rates for DALYs:** The monetary value of future stream of health benefits (i.e. annual DALYs saved) is discounted at 3 percent (a higher rate of 6 percent is used for the sensitivity analysis), per guidelines from WHO and the Disease Control Priorities Project.³⁰
- **GDP Growth:** An annual growth rate of 1 percent in real per capita GDP is used, being more conservative than the estimates provided by the IMF³¹.

Figure 4. Total DALYS averted by year compared to Europe and Central Asia counterfactual projections, baseline scenario



²⁹ See: D. Jamison, P. Jha, and D. Bloom, “Copenhagen Consensus 2008 Challenge Paper: Diseases,” 2008; <http://www.givewell.org/files/DWDA%202009/Stop%20TB/Copenhagen%20Consensus%20Paper-Diseases.pdf>.

³⁰ See: <http://www.dcp2.org/>.

³¹ Which predicts a growth rate of 2.2% for the period 2014-2018

Table 12. Benefits from DALYs averted (EUR '000s)

Discount Factor	2012-2017	2018-2020
	Benefits from DALYs averted	Benefits from DALYs averted
3%	37,518 EUR	54,987 EUR
6%	35,360 EUR	47,625 EUR

Expected overall benefits from the interventions

43. Finally, Table A4.9. presents the Net Present Value (NPV) and the estimated Internal Rate of Return (IRR) of the whole set of interventions. The sum of costs and benefits (i.e. the NPV of the interventions) is largely positive and the estimated IRR ranges between 4.85 and 9.83 percent considering only the first Program phase 2012-2017 and between 17.38 and 24.52 percent for the full Program duration 2012-2020, depending on the inflation used, which clearly shows the positive development impact of the proposed Program.

Table 13. NPV and IRR of the entire project (EUR '000s)

Discount Factor	2012-2017		2012-2020	
	NPV	IRR	NPV	IRR
3%	26,267 EUR	9.83 %	199,926 EUR	24.52 %
6%	12,890 EUR	4.85 %	159,615 EUR	17.38 %

Program Technical Risks

44. The wide scope of the Government's intended health sector reforms as articulated in the Government Program 2012–2020 was identified as a key technical risk to the success of the proposed Program. To mitigate these risks, the proposed Program supports a delimited set of reforms that are the focus of the Government's Five-year Program. Hospital participation in the Ministry of Health's centralized procurement reforms is voluntary, and low participation may have jeopardized the success of this critical element in the proposed Program. This has not proven to be an important risk. So far, all but one county (Zagreb) has elected not to participate in the Ministry of Health's financial consolidation efforts, which gives the Ministry financial control over hospitals in arrears. This, in turn, has resulted in a high rate of participation by hospitals.

45. A key potential risk to the proposed Program arises from the fact that full implementation of the hospital rationalization master plan requires considerably more resources than those available through the proposed Program. It is anticipated that EU Structural Funds could finance this resource gap. The Development of Emergency Medical Services and Investment Planning

Project supported technical assistance to develop a hospital rationalization master plan, and this will enable the Ministry of Health to develop specific proposals for funding that can be submitted to EU Structural Funds. The hospital rationalization plan will be completed only in December 2013. In the interim, however, the Ministry of Finance has expressed its commitment to support the Ministry of Health to meet interim funding needs.