Eiropas Savienības fondu darbības programmas „Izaugsme un nodarbinātība" 9.2.3.specifiskā atbalsta mērķa „Atbalstīt prioritāro (sirds un asinsvadu, onkoloģijas, perinatālā un neonatālā perioda un garīgās veselības) veselības jomu veselības tīklu attīstības vadlīniju un kvalitātes nodrošināšanas sistēmas izstrādi un ieviešanu, jo īpaši sociālās atstumtības un nabadzības riskam pakļauto iedzīvotāju veselības uzlabošanai" ietvaros īstenotā projekta „Veselības tīklu attīstības vadlīniju un kvalitātes nodrošināšanas sistēmas izstrāde un ieviešana prioritāro jomu ietvaros" **1.nodevums – an inception paper laying out key issues, working hypotheses, and an analytical framework for testing hypotheses.**

INCEPTION REPORT

Reimbursable Analytical Services
Support to Develop a Health System Strategy
for Priority Disease Areas in Latvia

The World Bank Group

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1. INTRODUCTION

The World Bank aims support to National Health Service (NHS) of the Republic of Latvia in its efforts to reduce the burden of four dominant diseases and conditions (cardiovascular diseases, cancers, mental diseases and perinatal and maternal conditions), which combined account for most of the burden of disease in Latvia. Under the umbrella of Reimbursable Analytical Services (RAS), the World Bank is providing analytical services to assist the NHS implement an evidence-driven and inclusive process that will:

i. Identify and quantify the importance of key health system bottlenecks;
ii. Identify the underlying problems and causes of observed bottlenecks; and
iii. Identify solutions and develop tools to drive their implementation.

The project will entail the collection of new data and experts' assessments of key health system functions, in addition to data set construction and analysis of existing administrative and survey data provided by the NHS and other important partners, including the Ministry of Health, the Center for Disease Control and Prevention, the Central Bureau of Statistics, the State Emergency Medical Service, and the Health Inspectorate.

To facilitate timely sharing of results with the government, the primary deliverables of the project will include (i) a series of short reports on observed bottlenecks, the private market for health care, and hospital volumes and quality of care; (ii) an operational manual that would provide guidance for the government to monitor observed bottlenecks in the future; (iii) separate policy, practice, and capacity reviews of key health system functions (benefits design, health technology assessment, organization of service delivery, quality assurance, provider payments, human resource and capital investment planning, and information management); and (iv) human resource and infrastructure maps of current resources with an indication of gaps relative to alternative service delivery models.

These analytical outputs and a series of workshops among stakeholders to validate their findings will help identify potential policy reforms to pilot to learn how to tackle the system bottlenecks contributing to high burdens of disease.

A second goal of the analytical collaboration is to build capacity among the National Health Service, the Ministry of Health, and their partners for identifying and monitoring system bottlenecks using indicators generated by their health system and for taking a system-wide approach to investigate problematic health outcomes, such as high rates of mortality for certain disease conditions or low rates of financial protection among households.

The Latvia RAS consists of the following components:

Component I: Identifying and quantifying the importance of key health system bottlenecks

1. Desk reviews and key informant interviews to develop hypotheses on key system bottlenecks and their causes within and across all health care levels.
2. Development of an analytical framework to test these hypotheses with data available from the NHS, Center for Disease Prevention and Control (CDPC), Health Inspectorate (HI), the Central Bureau of Statistics (CBS) and other public sources and a separate survey that captures the provision of services financed from out-of-pocket expenditures.
3. An in-depth assessment of hospital performance.
4. An in-depth assessment of stocks, distribution, and flows of human resources for health.
5. Support to the Ministry of Health in reviewing a strategy for local health promotion activities.

Component II: Identifying the underlying problems and causes of system bottlenecks

1. Policy, practice, and capacity review (including international benchmarking) for key health system functions.
2. Key informant interviews and focus group discussions.

Component III: Identifying policy solutions to address underlying causes of observed system bottlenecks

1. Development of infrastructure and human resource maps.
2. Reviews of alternative policy options and implementation lessons from other contexts (e.g. EU, OECD countries).
3. A workshop hosted by World Bank with the MoH and NHS.
4. Policy proposals to strengthen priority health functions.
5. Support to the NHS and MoH in validation and dissemination of findings among stakeholders.

This inception paper has three objectives. First, the paper aims to provide a preliminary analysis of the state of the health system, based on a review of the literature, available published data and reports, and key informant interviews that were carried out during the technical mission that took place Feb 9-13, 2014. Second, the paper outlines the conceptual framework for the work that will be carried out under the technical assistance. Finally, the paper outlines the initial hypotheses for four components of the work program, being the patient bottleneck analysis, the hospital performance assessment, the human resources study and the review of the NHS benefits package.

2. Country and Health System Context

Latvia is a small Baltic country, with a current population of approximately 2 million, with more than one third of its population living in the capital, Riga. Its population is both shrinking and aging, and by 2030, the share of the population 65 years and older has been projected to exceed one fifth (World Bank, 2014). Although there is a sizable minority of Russian speakers (27 percent) (Mitenbergs et al, 2012), the official language of Latvia is Latvian, and all communication from the government must be in Latvian.

Latvia joined the World Bank in 1992 and graduated from borrower status in 2007, although during the recent global financial crisis, the Latvian economy suffered severe contractions (an 18 percent reduction in annual GDP growth) and the World Bank began lending again to support the social and financial sectors. Recent trends in poverty headcounts, GDP per capita, and unemployment, however, suggest that the economy has started to recover. World Bank forecasts suggest annual GDP growth of 4 and 4.6 percent in 2015 and 2016.

Health outcomes

Since independence Latvia has experienced gains in average life expectancy, but it still lags behind its neighbors and other EU countries in terms of life expectancy at birth and perinatal and maternal mortality. Four main diseases areas have been identified in the National Health Strategy for 2011-2017 and more recent strategy papers as the health sector's top priorities: cardiovascular disease, cancer, maternal and perinatal health, and mental health. Standardized death rates for these conditions are also comparatively high. (Table 1) Cardiovascular disease, cancer and mental health conditions account for the most important burdens of disease (Table 2).

Table 1: Mortality is relatively high in Latvia (2010)

	Latvia	Estonia	Lithuania	EU
Life expectancy at birth (years)	73.7	76.03	73.57	80.16
Perinatal deaths per 1000 births	5.74	3.17	4.41	6.14
Maternal deaths per 100 000 live births	26.02	6.32	5.61	6.02
% of regular daily smokers, age 15+	33.7	26.2	21.8	26.84
Alcohol consumption (l/capita), age 15+	9.75	11.36	12.9	10.04
SDR, diseases of circulatory system*	140.24	92.48	120.64	43.41
SDR, ischemic heart disease*	66.21	39.75	67.01	18.76
SDR, cerebrovascular diseases*	28.14	12.15	22.33	8.49
SDR, malignant neoplasms*	93.99	69	89.17	70.65
SDR, suicide and self-inflicted injury	16.84	13.89	27.82	9.52

Source: European Health for All Database, World Health Organization Regional Office for Europe

* Standardized Death Rate (SDR) per 100 000 (0-64 years)

Table 2: Top 25 causes of Years of Life Lost (YLL), Latvia, 2010

Rank	Disorder	YLL, % of total
1	Ischemic heart disease	26.1%
2	Stroke	14.0%
3	Cardiomyopathy	4.3%
4	Lung cancer	3.8%
5	Self-harm	3.4%
6	HIV-AIDS	3.2%
7	Road injury	2.5%
8	Colorectal cancer	2.3%
9	Alcohol use disorders	2.0%
10	Cirrhosis	1.9%
11	Stomach cancer	1.9%
12	Lower respiratory infections	1.7%
13	Breast cancer	1.6%
14	Drowning	1.5%
15	Interpersonal violence	1.4%
16	Pancreatic cancer	1.3%
17	Falls	1.3%
18	Diabetes	1.0%
19	Congenital anomalies	0.9%
20	Fire	0.9%
21	Hypertensive heart disease	1.0%
22	COPD	0.8%
23	Ovarian cancer	0.8%
24	Brain cancer	0.8%
25	Kidney cancers	0.8%

Source: IHME (2010)

Financing

Public spending in health appears to be low: not only is health expenditure per capita lower in Latvia compared to its neighbors, but the fraction of spending borne by households is also considerably higher. (Table 3) Government expenditures in This reliance on private financing likely causes exclusion among the poor and decreases the efficiency of total health spending because it greatly reduces pooling of health risks.

Table 3: The Latvian government under-invests in health (2012)

	Latvia	Estonia	Lithuania
Health expenditure per capita ^	792.5	1010.1	859.2
Public health expenditure (% of total health expenditure) ^	56.7	79.9	70.8

General Government Health Expenditure as a % of General Government expenditure *	9.8	12	12

Source: ^ World Development Indicators (2014) * WHO Global Health expenditure database

Since independence, Latvia has experimented with multiple reforms in the health sector, starting with social health insurance with earmarked funding for health and switching to a single-payer system in 2011 with general tax financed statutory health care provision. The National Health Service is the main purchaser of care and contracts with both public and private providers for services covered through a benefits package which it updates every year based on its budget allocation from the state. (Mitenbergs et al. 2012) These contracts with providers specify monthly and annual quotas and reimbursement rates for services covered under the benefits package. Most general practitioners and specialists practice privately and contract directly with the NHS. They are paid through a combination of capitation and fee-for-service payments, with up to 10 percent of their income determined by their performance, as measured by a set of 13 indicators collected by the NHS, the Center for Disease Prevention and Control, and the State Emergency Medical Services. Hospitals are paid according to global budgets.

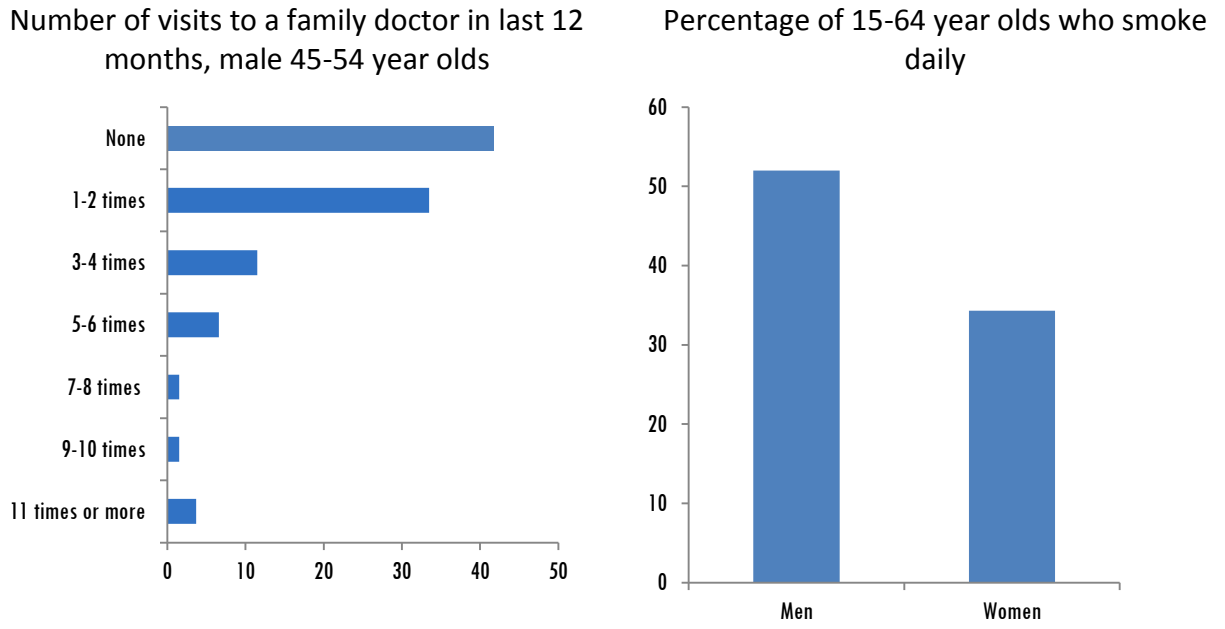
Households are responsible for 100 percent of the costs of non-contracted services or for contracted services that they wish to receive earlier than what would be dictated by waiting lists. Private health insurance accounted for less than 1 percent of total health expenditures.

The recent global financial crisis has taken a toll on the Latvian health system. Budget cuts led to a 55 percent reduction in staff employed by Ministry of Health and its subordinate agencies and a marked reduction in institutional capacity. After the crisis, patient copayments also increased by more 50 percent. (World Bank 2010) Although a Social Safety Net program financed by the World Bank exempted low income households from user charges and charges for overnight hospital expenses, these exemptions were rolled back in 2012 for all but the poorest households.

Access to health services

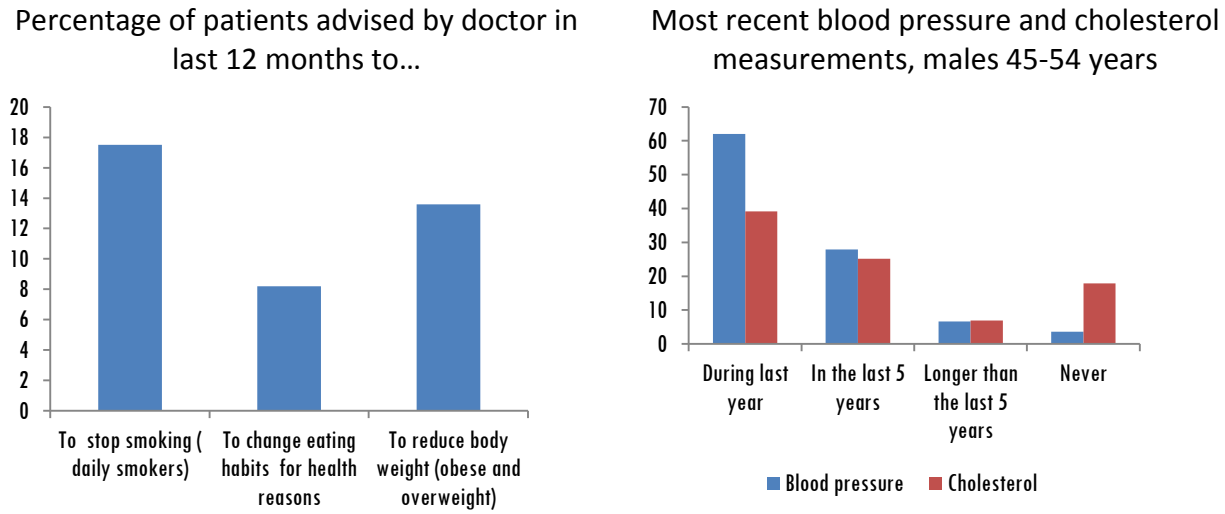
In addition to poor financing, timely access to services and health promotion and prevention appear weak according to available data. Among women first diagnosed with breast cancer in 2012, for example, approximately one third were in Stages 3 or 4; 55 percent of colorectal tumors were diagnosed in these stages. (CDPC 2013) Utilization rates for primary care services are low, and physicians do not appear to address poor lifestyle choices when they do meet with patients. (Figure 1 and Figure 2)

Figure 1: Utilization rates are low for primary care and lifestyle choices are less than optimal



Source: Center for Disease Prevention and Control (2012) Health Behavior Among the Latvian Population

Figure 2: The quality of primary care may be inadequate



Source: Center for Disease Prevention and Control (2012) Health Behavior Among the Latvian Population

Human resources in health

The supply of health workers has changed significantly in Latvia in the last years. Despite the increase in the number of general practitioners, the number of physicians declined between 1990 and 2010 (from 3.54 per thousand inhabitants to 2.91) and there is evidence of severe shortages in key specialties (e.g. obstetricians, cardiologists). Latvia has a low proportion of nurses compared to average European Union and other countries in the region. The density of nursing and midwifery personal is 4.73 per thousand population, significantly lower than in Lithuania which is 7.17 and in Estonia, equal to 6.43 (WHO, 2015).[1] The ratio of mid-level cadres and doctors equal to 2:1 which suggest that doctors undertake some duties that should be carried out by nurses and other mid-level cadres (Mitenbergs et al. 2012). In addition to the absolute shortage and skills imbalance, there is also a strong concentration of health workers in the capital Riga. Around 60% of the physicians are practicing in Riga (WHO, 2010).

Health system data and analysis

Beyond indicators of mortality and morbidity, there is little systematic information on more intermediate outcomes in the health system that could underlie poor health outcomes. For example, do patients forego care to avoid the time and financial costs of waiting lists? Are health promotion functions appropriately coordinated across local governments, general practitioners, and specialists? Does the current absence of established patient pathways and clinical guidelines lead to late diagnoses and inconsistent treatment quality across patients?

Some of these system level questions can be investigated with data that exists but that has thus far not been compiled or used to address these types of questions. For example, the payment data of the NHS, which uses unique ID numbers for patients and records referrals, diagnostic testing, and diagnoses, can help characterize current patient pathways, waiting times, and the appropriateness of treatments. Similarly, surveillance data from audits of the Health Inspectorate may provide lower bounds for the quality of services, as these audits typically occur in response to a suspicion or complaint from patients.

Some data, however, does not exist or has not been put together in an analyzable form. Although accounting for more than 40 percent of health facilities' revenues, the private market for services has been largely under-researched. While facilities report their volumes of non-contracted services to the Center for Disease Prevention and Control, prices of these services remain unmonitored and must be inferred from earnings data compiled by the Central Bureau

[1] Health Workforce Statistics: http://www.who.int/hrh/statistics/hwfstats/en/

of Statistics. Equally important, the incidence of out-of-pocket payments across wealth groups, disease conditions, or geographic areas has not been measured, nor has the extent of foregone care. Similarly, it is not clear if some of Latvia's remaining hospitals have the patient volumes to sustain adequate levels of quality.

3. Analytical Framework

The study design focuses on identifying and gauging the importance of performance issues or system bottlenecks that contribute to high disease burdens (Component 1) and identifying the underlying problems and causes of these bottlenecks (Component 2).

The starting point for the proposed analysis will be a health systems perspective that distinguishes among health outcomes (such as mortality or disease burdens), intermediate outcomes (such as timeliness of care or adherence to internationally established clinical guidelines), outputs (or service characteristics), and the core health system functions of resource generation, financing, service delivery, and stewardship. (Figure 3)

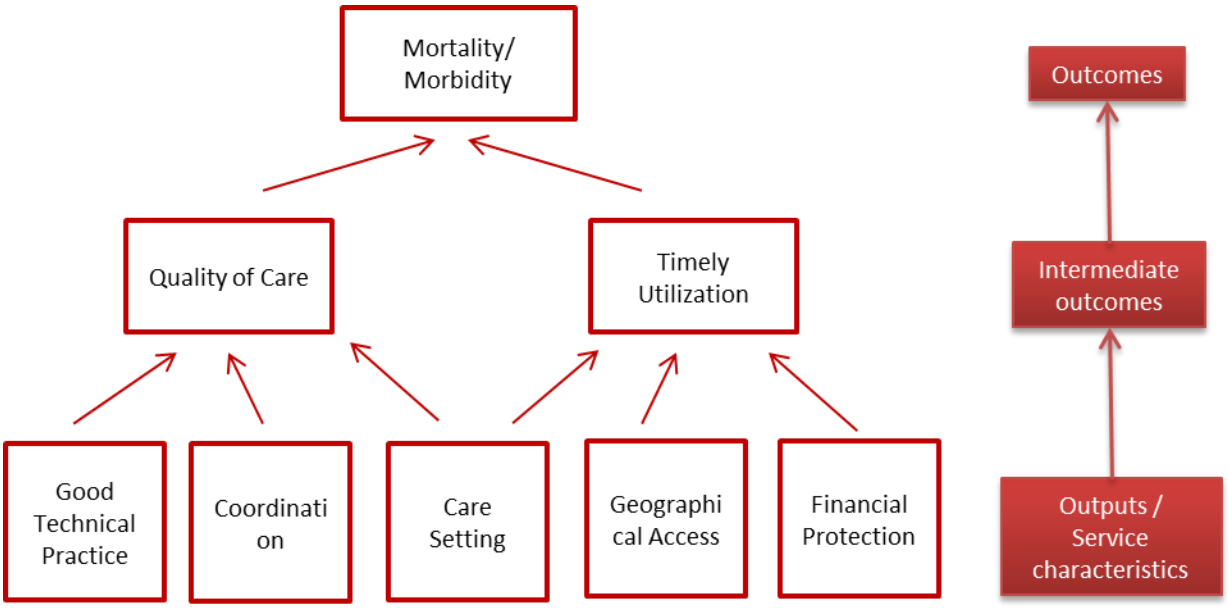
Figure 3: Health Systems results chain

Our **analysis of system bottlenecks (component 1)** start with a framework in which final mortality and morbidity outcomes depend on timely utilization of care and the delivery of quality health care services (Figure 4). Utilization and quality in turn result from a number of outputs or service characteristics that a health system should deliver - good technical practice within facilities, coordination of care between and across levels (health promotion and prevention, primary care, ambulatory specialist care, acute inpatient care, rehabilitation and nursing care), appropriate care settings (such as hospitals, primary care facilities, specialized centers or even homes), adequate geographic access to facilities and providers, and financial protection for households.

The activities under Component 1 will therefore primarily focus on identifying system bottlenecks that interfere with timely utilization and quality of care. For example, a system bottleneck underlying the high prevalence of Stage 3 and Stage 4 cancer diagnoses could be the average time lag between an initial suspicion of cancer and a final diagnosis. This could

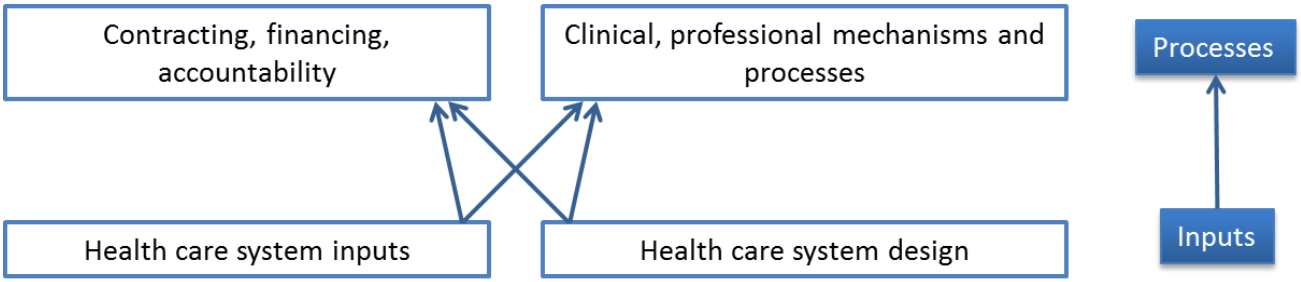
resulting from poor coordination of care (between general practitioners and specialists), poor geographical access to diagnostic facilities, or the high price of circumventing long wait lists for specialists or diagnostics. High cancer mortality may also result from poor quality of care resulting from inconsistent implementation of clinical guidelines (i.e. poor technical practice).

Figure 4: A framework for identifying system bottlenecks or performance issues (Component 1)



Once the system bottlenecks are identified, **we will identify the underlying problems and causes of these bottlenecks (component 2).** Our framework posits that the performance bottlenecks can arise from causes related to system design or from the level of inputs that the health care system has to work with (Figure 5). For example, long time lags between an initial cancer suspicion and final diagnosis may result from the way in which the NHS contracts services (often in terms of quotas for diagnostic tests) and prioritizes individuals on wait lists. A poorly functioning quality assurance system could lead to limited adherence to clinical guidelines. Low stocks or unequal distributions of specialized human resources and health technologies could also contribute to outcomes like geographic access to services and lack of coordination of care. All of these factors in themselves might be traced back to system design issues (e.g. inefficient contracting modes) and/or to the amount of health care system inputs.

Figure 5: A framework for identifying underlying problems in the health system (Component 2)



After identifying and gauging the importance of performance issues or system bottlenecks that contribute to high disease burdens (Component 1) and identifying the underlying problems and causes of these bottlenecks (Component 2), the World Bank team will assist the National Health Service in **evaluating policy reform options that can address the underlying causes of the identified performance issues. (Component 3)**

4. Research Methods

This section describes the analytical methods, hypotheses, indicators, and data sources that will be used to apply the framework outlined in the previous section to the data currently generated by the health system in Latvia and to data that might require additional collection by the World Bank team. At the date of writing, the team has not been able to work with the requested data to test the methods and indicators, and as such these should be viewed as tentative. The actual distribution of cases and procedures, in addition to the completeness of data and our ability to successfully track patients across databases, will determine the final set of hypotheses that can be tested and the methods and indicators that can be used to test them. As the work progresses, the World Bank team will continue to communicate with its main counterparts in the NHS, MoH, CDPC, and SEMS to ensure that the assumptions made about the data are accurate.

The proposed components of the RAS aim to identify health system areas for which data suggests room for improvement – either in terms of the quality of care delivered or in the value-for-money provided by existing services. The overall study will use various analytical methods to carry out the analysis required to meet these larger project objectives, including quantitative data collection and analysis, desk reviews, key informant interviews and qualitative data collection and analysis. (Table 4) Quantitative data collection and analysis will be used in the three studies carried out under component 1: the patient bottleneck analysis, the human

resources in health study and the hospital quality study. Some of the policy and practice reviews (PPR) prepared under component 2 (provider payments, health promotion and quality assurance) will be mostly based on desk reviews and interviews with key informants; others (benefits package and service delivery model) will be based on findings of the bottleneck analysis.

Table 4: Research Methods, by Component and Study

Component		Quantitative data analysis	Quantitative data collection	Desk reviews	Key informant interviews	Qualitative data collection & analysis
1	Patient bottlenecks analysis	√	√	√	√	√
1	Human resources in health study	√	√	√	√	√
1	Hospital quality study	√	√	√	√	√
2	Benefits package Policy and Practice Review (PPR)	√		√	√	
2	Service delivery model PPR	√		√	√	
2	Capital investment PPR			√	√	
2	Provider payments PPR			√	√	
2	Health promotion PPR			√	√	
2	Quality assurance PPR			√	√	
3	Infrastructure and human resource maps	√		√	√	

5. Patient Bottleneck Analysis

Objective

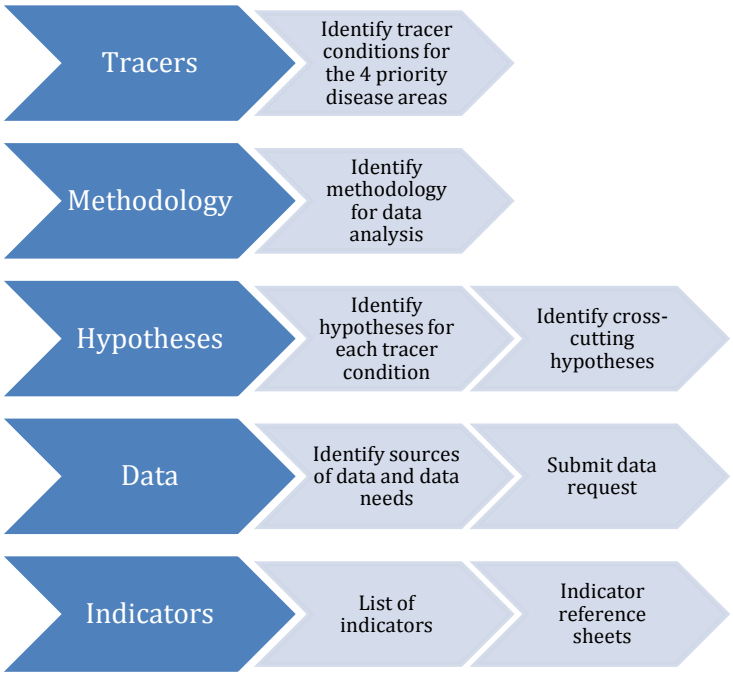
The objective of the patient bottleneck analysis is to identify and quantify the importance of bottlenecks or performance issues that impede the reduction of the burden of the four priority disease groups.

Initial assessment

In the setup phase of the patient bottleneck analysis, we identified the five main building blocks of the analysis: tracers, hypotheses, data, methods and indicators. (Figure 6) First, we identified tracer conditions in each of the four priority disease areas. Since an exhaustive study of each disease area is beyond the scope of the present study, the team will use tracer conditions within each disease area to illuminate performance issues that could be common to other conditions within the same disease area. Just as a radioactive tracer in medicine allows a physician to track progress through a certain organ system, an ideal tracer condition in this study should allow us to track performance through the entire health system and assess fundamental functions such as screening, diagnosis, treatment, and follow-up care. Conditions that lack a screening component (such as ovarian cancer) and conditions for which treatment options are limited (such as lung cancer) do not make good *tracers* because they do not allow us to illuminate the performance of the system in those crucial areas (i.c. cancer screening and treatment).

Second, on the basis of a desk review of published data and literature, as well as key informant interviews carried out in Latvia in February 2015, we identified working hypotheses for each of the tracer conditions, as well as potential sources of data. We also identified a set of cross-cutting hypotheses relating care to patient characteristics such as time of onset of disease, socio-economic status, geographic location, ethnicity and gender. Third, we reviewed the availability of data and identified a proposed approach to data analysis. Finally, we started compiling the list of indicators and the indicator reference sheets. As mentioned earlier, this list should be considered tentative and will be revised after preliminary analysis of the data.

Figure 6: Setup phase of the patient bottleneck analysis



Tracer conditions

The proposed tracer conditions for the four priority disease areas are presented in Table 5. The selection of tracer conditions was based on the importance of different conditions in the burden of disease and as causes of death in Latvia. Please see *Annex 2: Identifying tracer conditions for cancer* (in particular, Table 10) for an example of the process used to narrow down candidates for the tracers proposed for examining health system performance for cancers.

Table 5: Tracer conditions for priority disease areas

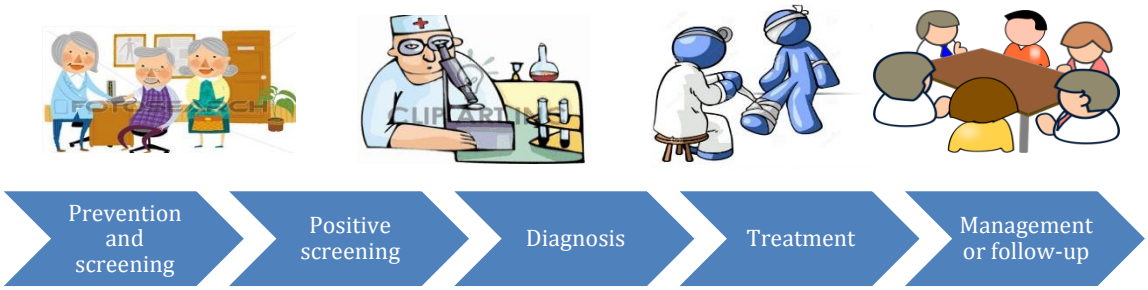
Cardiovascular Diseases	Cancers	Mental Health	Maternal and Newborn Health
Coronary artery disease (CAD) Acute myocardial infarction (AMI) Congestive heart failure (CHF) Stroke Hypertension* Diabetes*	Breast Cervical Colorectal	Depression Substance abuse	High-risk pregnancy

* As a risk factor

Methodology

The proposed approach for data analysis is to use the tracer conditions to follow a "patient pathway." (Figure 7) For each of the tracer conditions, we will identify potential bottlenecks corresponding to different stages in the patient pathway, namely prevention and screening, positive screening, diagnosis, treatment and management or follow-up. Accordingly, hypotheses and indicators need to be defined so that they capture all relevant stages of the patient pathway for each of the tracer conditions, so as to give an overall appreciation of the quality of care for each tracer condition.

Figure 7: Bottleneck analysis along the patient pathway



Where under-diagnosis or sample size might be an issue, the analysis may have to go beyond tracer conditions. In these cases, working backwards from extreme events and tracing the patient pathway can also illuminate how the different components of the health system are functioning and providing integrated care. For example, for a patient hospitalized for acute myocardial infarction, the NHS payment data should permit a description of the patient's contacts with the health system in the previous 12 months – what level of care was provided (primary, specialist, inpatient), whether a diagnosis had been made, and whether treatment had been initiated. Similarly, it might be useful to chart the patient pathway of suicides, repeat intoxications, stillbirths, and perinatal deaths.

Working hypotheses

In line with the proposed patient pathway methodology, the working hypotheses listed in Table 6 are arranged chronologically.

Table 6: Working hypotheses and sources of data, by priority areas

	Hypothesis	Source of data
Cancer	▪ Screening rates are too low. ▪ Delays between suspicion and diagnosis lead to cancer diagnosis at relatively advanced stage. ▪ There are delays between diagnosis and treatment ▪ Diagnoses may be inaccurate and the corresponding treatment may thus be suboptimal. ▪ Care is not appropriately coordinated or integrated ▪ Financial barriers are associated with delays in care. ▪ Patients do not receive palliative care in the appropriate setting.	▪ NHS payment data ▪ CPDC cancer registry ▪ CPDC death registry
Cardio-vascular conditions	▪ Preventive care and screening for risks occurs infrequently ▪ Observed acute cases lacked management of underlying conditions (hypertension, diabetes and coronary artery disease). ▪ Inadequate follow-up after acute episodes is associated with high rates of readmissions. ▪ Quality of care after acute myocardial infarction is inadequate.	▪ NHS payment data ▪ CPDC diabetes registry ▪ CPDC death registry
Mental health	▪ Depression is under-diagnosed. ▪ Depression is not adequately treated. ▪ Under-diagnosis and under-treatment of depression are associated with high rates of hospital readmission for cancer and CVD.	▪ NHS payment data ▪ CPDC mental health registry
High-risk pregnancies	▪ High-risk pregnancies are not adequately identified and treated. ▪ High-risk pregnancies are not referred to higher level hospitals. ▪ Quality of care in prenatal and perinatal period is not optimal.	▪ NHS payment data ▪ CPDC birth registry

Table 7: Cross-cutting hypotheses

	Hypothesis	Source of data
Timeline	▪ Patients diagnosed towards the end of the year are at higher risk of not receiving appropriate care.	▪ NHS payment data, CDPC disease registries
Socio-economic and education	▪ Patients from lower socio-economic backgrounds are less likely to receive appropriate care. ▪ Patients from lower socio-economic backgrounds are more likely to face delays in care. ▪ Patients from higher socio-economic backgrounds are more likely to pay out of pocket for care.	▪ Tax database ▪ Census (education)
Geographic	▪ Patients from rural areas are more likely to experience delays in care and less likely to access appropriate care for their conditions.	▪ Patient location information in NHS list of enrolled persons.
Ethnicity	▪ Language barrier may prevent non-Latvian speakers from accessing care on time.	▪ Census
Gender	▪ The gender gap in use of preventive care and in healthy lifestyles is wider in Latvia than in other countries.	▪ Same as Table 6

Data

In order to be able to carry out the patient bottleneck analysis, we will require the following data:

- Individual level data on utilization of care at different levels, including:
    - Primary care utilization (to measure prevention and screening, initial treatment, etc.)
    - Secondary and tertiary care utilization (to measure treatment, appropriate location of treatment, etc.)
    - Diagnostic and treatment procedures
    - Emergency medical care
- Individual level data on birth events (with select birth characteristics) and deaths (including cause of death)
- Individual level data on underlying conditions, where available (eg. cancer diagnosis and type, low birth weight, mental health diagnosis)
- In order to be able to test the cross-cutting socio-economic hypotheses, we will need to merge the health service data with information on the socio-economic characteristics of patients. We propose to do this using the tax returns database that is available at the

Central Bureau of Statistics, as well as education and other data available from the Census.

A data request was submitted to NHS on March 2nd, 2015. The summary table is attached in Annex 3.

The analysis will also require data on privately financed or non-contracted health care services. The National Health Service and the Ministry of Health also seek information that can help them characterize the volumes and financial value of these services that take place outside of NHS contracts – either among non-contracted providers, in situations in which a patient wants to avoid a long waiting list, or at times when contracted providers have exceeded their monthly or yearly quota of contracted services. Without out this data, the analysis could draw incorrect inferences about patient pathways if patients must use a combination of contracted and non-contracted services for a particular tracer condition. Thus, a separate facility survey will need to be carried out among a sample of general practitioners, specialists, hospitals and long-term care facilities to measure the volumes, prices, and patient profiles associated with privately-financed services. The content and methodology of the survey will be determined after initial analysis of the existing data and finalization of the list of indicators. At the time of writing, it appears that the "survey" may consist primarily of an additional data request for private facilities to send data to the NHS on non-contracted services.

Indicators

We compiled a draft list of indicators and their specifications for the tracer conditions identified above. The indicators were compiled using the following approach:

i. We first compiled a comprehensive list of indicators from various sources including the OECD, the WHO Health for All (HFA) project, and the national framework agreements of selected countries such as Australia, Canada, France, and the United Kingdom. We also included quality of care indicators from the USA CDC, the Agency for Health Care Research and Quality, the American Cancer Society, EU Quality Assurance Guidelines.
ii. We requested and reviewed extracts from various databases at NHS, CPDC, State Bureau of Medicines, State Emergency Medical Services (SEMS), Ministry of Health(MoH), and Ministry of Welfare. We also reviewed lists of indicators from the Latvia Population Census.
iii. We compiled a proposed list of indicators based on the following criteria (a) our assessment of indicators measuring timing and quality of care for the four priority

disease areas, based on field visits and a desk review of the literature; (b) availability of sufficient information in the Latvia databases to compute the indicator.

Error! Reference source not found. includes a preliminary directory of indicators to be used in he patient bottleneck analysis for the cancer and cardiovascular tracer conditions.[23]

Given potential censoring in the data (under-diagnosis of depression, for example) and an uncertain distribution of ex-ante high risk pregnancies, additional directories for mental health and maternal and perinatal health can be compiled and submitted for discussion once the World Bank team gets a preliminary look at the payments data and the birth and death registries.[4]

Next steps

The next steps for the patient bottleneck analysis are as follows:

- Obtain the necessary data to perform the analysis
- Carry out a preliminary analysis of the data, including:
    - Verify the consistency of databases, clean data where needed (estimated 2 person months)
    - Merge databases (estimated 2 weeks)
    - Compute indicators
        - Estimate 1.5 days per indicator, estimated 50-75 indicators: approx. 5 person-months
- Present preliminary results: approximately 4 months after data access

[2] Additional indicators (in response to comments on an initial draft of the Inception Report) include: the likelihood of getting any treatment (chemo, radiation, or surgery) within 30/60/90 days of a diagnosis [reveals existence of delays in treatment], the average number of diagnostic tests and the average length of time between tests [reveals (lack of) coordination of oncological care], and survival rates for specific cancers.
[3] Please see a matrix of comments from the NHS, MoH, and their stakeholders and responses prepared by the World Bank team for additional information on proposed indicators.
[4] Some candidate indicators for the mental health tracers include: the number of hospital readmissions for mental health conditions, the likelihood that a suicide or hospitalization for mental health was preceded by related primary or specialist outpatient care, the likelihood that an emergency admission due to alcohol translates into a future admission for treatment or outpatient treatment; the average level (primary, specialist, emergency, inpatient) of first diagnosis for a mental health condition.

6. Human Resources for Health Analysis

Initial analysis

Our initial analysis is based on a desk review and on key informant interviews that were carried out in February 2015. Based on this initial analysis, we find that human resources for health (HRH) challenges in Latvia include unequal geographical distribution, unbalanced skill mix, low compensation associated with inappropriate incentives, possibly leading to excessive workloads and low quality of care. These HRH shortcomings seem to be one of the roots of the challenges faced by the Latvian health system and the ability to address them will determine the medium and long term success of any reform effort.

Possible explanations for the persistent HRH bottlenecks include low compensation, workforce ageing, lack of career opportunities for young and newly graduated health workers (especially physicians), migration and contractual arrangements. Health worker salaries are significantly lower than those for comparable professionals in the Latvian economy and health workers in other EU countries. During the February visit, it was reported that the average salary of a specialist is around 600 Euros. Specialist physicians are paid mostly through fee-for-service schemes and, in general, are able to maintain reasonable levels of income when they have contracts with several providers (hospitals, clinics, etc.). General Practitioners (GP) are contracted by the National Health Services (NHS) using a combination of capitation payment and service fees. Some GP practices attend a large number of patients (i.e. over 2000 or even 3000 patients), which may result in high workloads and lower quality of care.

There have been some initiatives to provide incentives for attracting health workers to rural and remote areas. For example, some municipalities provide scholarships to students in return for a commitment to practice in the municipality after graduation, for the same period of time they received support. However, poor targeting (not always selecting students from the same municipality) and loose reimbursement agreements (amount to be reimbursed to municipality in case of opting out is significantly lower than average salary after graduation) limit the impact of these initiatives.

Working hypotheses

The hypotheses to be addressed and quantified in this component are the following:

- To what extent does the current shortage of specialized staff restrict access to diagnostic and therapeutic procedures, especially for the four priority conditions?
- What are the regulatory frameworks, contractual arrangements and governance structures that contribute to the current HRH bottlenecks in Latvia?

- What is the role of compensation in determining outflows (migration, turnover) and workload of health workers (especially for specialists and health workers with multiple jobs)?
- To what extent are health workers competences adequate? What are the major limitations that health workers encounter when trying to apply their skills and knowledge in their practice?
- To what extent is the capacity to train health professionals aligned with the objectives of strengthening primary health care in Latvia? What are the main bottlenecks?
- To what extent does multi-employment contribute to low quality of care, high staff turnover and low health worker productivity?
- To what extent does dual-practice contribute to longer waiting times for patients, low quality of care and lack of financial protection (increased out-of-pocket payments)?
- What scope is there to improve the work profile of GPs (improved tasks, services, exams/tests, competences) and to shift tasks, especially within the primary care level (role, functions and competences of nurses and medical assistants)?
- What are the main determinants of lack of coordination of care between GPs and specialists?

Methodology

In order to identify the root causes of HRH imbalances and identify possible solutions, we will analyze a combination of quantitative and qualitative data.

The quantitative data will be used to describe the current composition of the Latvian health workforce, focusing on the recent trends in the production and availability of health workers across cadres and specialties, geographical distribution, distribution among sectors and cadre levels, relative earnings across sectors and cadres, and governance and regulatory structures. Such an analysis will identify and measure key dimensions of the health workforce and set the context for an in-depth analysis of specific aspects through qualitative data analysis. The data used will include the existing labor force survey, the tax database, and data from the Register of Medical Personal. Given existing gaps in information on full-time equivalents, additional HRH data will may need to be requested from a sample of facilities.

Qualitative data will be gathered through focus group discussions among health workers (physicians, nurses, and other mid-level cadres), students and patients. These discussions will help us identify issues related to work conditions, employment opportunities, quality of care and access to services. They will also help us identify any coping strategies used by health workers to address income and education issues.

Key indicators

- Workforce composition (skill mix) and primary health care team composition, functions and roles;
- Workforce distribution (rural versus urban, between levels of care and public and private sectors);
- Migration, staff turnover and attrition, workload and competences (technical quality of care) of health care workers.

Data

- CDPC: Performance indicators for GPs (13 indicators related to payment of bonuses)
- Health Inspectorate:
    - Register of medical personnel: uniform nationwide information system (renewed every 5years)
- We will assess what data are available and complement them with a facility survey. The proposed content of the HRH module of the facility survey includes: performance, competences/technical quality, employment preferences, remuneration.
- Hospital association: data on workforce
- Central Bureau of Statistics:
    - Tax database to estimate income;
    - Labor force survey.

7. Hospital Care: Quality of Care and Service Volume

Initial analysis

In 2009, the hospital sector experienced a large-scale reform characterized by reducing the number of hospitals and shifting patient care from inpatient to outpatient services Some district hospitals were merged into large regional complexes (e.g. Daugavpils, Kraslava and Preila hospitals), whereas other small local hospitals were converted to hospitals serving primarily day-surgery and outpatient services (e.g. Saldus). As a result the number of hospitals beds in Latvia declined from 36,000 in 1990 to 12,000 in 2010. Similarly, the number of acute beds per 1,000 population dropped from 5.3 in 1995 to 3.4 in 2010 (Karaskevica and Tragakes 2001). These changes aimed at reducing costs and improving resource efficiency by promoting day surgery and home-based care. However, inpatient discharges and bed-occupancy did not decline at the same rate, reflecting the need of implementing further initiatives, such as hospital networks and concentration of services.

Hospital performance and quality are essential inputs in attaining good health outcomes and providing efficient health services. Yet, to our knowledge, there are no studies in Latvia that have analyzed how the hospital sector performs and how it can be improved to increase efficiency given current budgetary constraints.

Objectives

The hospital quality study has the following objectives:

(i) Documenting the distribution of key clinical services volumes in the hospital network to and benchmarking these volumes to thresholds associated with quality of care (which either have been estimated in the medical literature and/or have been used as minimum standards in other countries);[5] [6] and (ii) Gauging the association between selected surgical volumes and indicators of quality of care for conditions where the literature provides little guidance on the level of the thresholds[7]. The analysis will also map geographic accessibility and utilization of these hospitals.

Scope

The analysis will focus on secondary and tertiary hospitals contracted by NHS. These hospitals concentrate 90% of curative beds in the country. The analysis will include standard, intermediate and complex procedures associated with the four priority disease areas: cardiovascular disease, cancer, maternal and perinatal health, and mental health.

Hypotheses and indicators

Variations in hospital and surgical activity rates may reflect differences in need, but also differences in clinical practices and supply-side factors such as the number of hospital beds and operating theatres, or the number of surgeons. They also may reflect over-use (or inappropriate use) of certain surgical interventions: some interventions may be performed on patients for which scientific evidence suggests that the risks outweigh the expected benefits (e.g. non-emergency C-sections) while other interventions may be performed in an

[5] These procedures/cases include abdominal aortic aneurysm, bypass, cancer resection (esophageal, pancreas, bladder), percutaneous coronary intervention, and low birth weight.
[6] See for example: AHRQ (2002). "Guide to Inpatient Quality Indicators: Quality of Care in Hospitals—Volume, Mortality, and Utilization." Rockville, MD: Agency for Healthcare Quality and Research; Veillard, J., F. Champagne, et al. (2005). "A performance assessment framework for hospitals: the WHO regional office for Europe PATH project." International Journal for Quality in Health Care 17(6): 487-496; and Birkmeyer, J. D., A. E. Siewers, et al. (2002). "Hospital volume and surgical mortality in the United States." New England Journal of Medicine 346(15): 1128-1137.
[7] These cases can include colonoscopies, colecytectomies and hysterectomies.

inappropriate setting of care (e.g. treatment of high-risk pregnancies at low capacity hospitals). On the other hand, there might also be under-use of certain interventions that may be medically recommended but not provided for patients with certain conditions (e.g. thrombolysis or angiography). Understanding such variations in medical practice is key to understanding the efficiency and quality of health service delivery.

The hospital quality study aims to address a set of hypotheses related to bottlenecks in three areas of the analytical framework: coordination across levels of care, care in the right setting, and quality of care.

Care in the right setting

There are two type of issues associated with hospital activity and setting of care. The first occurs when severe complex cases are treated at low-capacity hospitals either as result of delayed diagnosis or referral, or inadequate protocols. These cases can have deleterious effects on quality of care and on patient's health outcomes. The second issue deals with low complexity cases being performed in high-capacity hospitals, potentially indicating an inefficient use of resources.

Volumes of high complexity cases managed in low-capacity hospitals:

- Volumes of high-risk pregnancies and deliveries (eclampsia, unplanned blood transfusion, postpartum hysterectomies, unplanned transfer to ICU, post-partum hemorrhage);
- Volumes of neonatal care for high risk/low birth weight / premature babies in hospitals without perinatal center or pediatrician;
- Volume of neonatal care for very high risk/very low birth weight /very premature babies (<32 weeks) treated in local/district hospitals;
- Volumes of C-sections with and without complications;
- Volumes of strokes managed outside of designated stroke centers ;

Low complexity cases performed in high-capacity hospitals (tertiary care):

- Uncomplicated/ low-risk deliveries in tertiary care.

Coordination across levels of care

Poor integration of care results on duplicate diagnostic tests, poor patient follow-up and incentives to access tertiary care through emergency care.

Emergency services serve as a stepping stone for patients to bypass waiting lists:

- Volumes of elective surgeries performed on patients accessing care through emergency care.

Volumes of patients with time sensitive procedures delayed in local hospitals:

- Number of unplanned transfers of mothers in labor to specialist units;
- Number of low-risk newborns referred to specialist units.

Efficiency and quality of care

The association between higher procedure-specific volumes and better quality of care in complex surgical procedures has been demonstrated in a number of studies in USA and Europe. (Luft, Bunker et al. 1979; Begg, Cramer et al. 1998; Birkmeyer, Siewers et al. 2002) Volume indicators, when aggregated at hospital level, allow hospital quality performance comparisons and provide basis for a selective referral policy based on minimum volume quality levels. (Leapfrog Group 2004) The practice of selective referral is seen as a mean to increase quality and reduce costs (economies of scale) by concentrating cases in places where physical and human resources will be better used.

This analysis aims at eliciting whether current surgical volumes are adequate to achieve sufficient level of quality of care.

High-risk complex surgeries/cases performed at <u>low-volume</u> hospitals:

- Measure the distribution of procedure volumes across all hospitals and benchmark them against volume thresholds established in the literature for seven surgical procedures: percutaneous coronary intervention (PCI); coronary artery bypass graft; abdominal aortic aneurysm repair; aortic valve replacement; pancreatic and esophageal resection. For example, the study will graph the distribution of Abdominal Aortic Aneurysm (AAA) repair volumes for each hospital and benchmark them against a minimum volume standard of 50 cases per year used in Germany, the United States, and the United Kingdom.
- Compare procedural volumes performed in regional and teaching hospitals in Riga.
- Measure the association between volume and quality of care where there is no established threshold. The proposed quality indicators are length of stay, in-hospital mortality rate, complications rates, and re-admission rates.

Low-complexity cases that do not conform to good clinical practice in low-capacity hospitals:

- Extended length of stay associated with delivery;
- Percentage of deliveries carried out by C-sections (planned and emergency);

- Percentage/volume of term infants transferred or admitted to secondary level or tertiary level for reasons other than congenital anomalies.

Low-capacity hospitals operate below capacity:

- Number of major surgeries per operation theatre per month;
- Breast cancer screening volumes in hospitals, and number of hospitals not performing such procedures (mammograms and colposcopy);
- Colonoscopy volumes in hospitals and number of hospitals not performing such procedure;
- Distribution of births by assigned level of care
- Number of angiographies per month and number of hospitals performing such procedure;
- Number of hospitals with a chemotherapy and/or radiation unit and volume of chemotherapy and radiation cycles.

The tracers and procedures are selected across the four priority areas mentioned above based on a set of criteria of pertinence and relevance for health care provided at the hospital. The first selection criterion would be the availability of clinical evidence on the relationship between procedural volume and health outcome; (ii) procedures believed to contribute significantly to in-hospital mortality and (iii) procedures for which data is complete and well-coded. In addition, a set of standard procedures usually performed in local and regional level hospitals will be included (e.g. C-sections and hysterectomies).

Data Sources

The first data source available is the NHS in-patient registry. Hospitals contracted by NHS provide patient information on regular basis. A first analysis of the data extracts provided shows that the information includes diagnosis codes (SSK-10), as well as procedural codes (NOMESCO or Opereijas code) at individual level. For each patient movement it is possible to identify whether the patient was discharged, transferred or died. In-hospital mortality can be estimated using this information and confirmed with the death registry from CPDC.

8. Review of the Benefits Package

Initial analysis

The Latvian benefits package is primarily outlined in the Health Care Organization and Financing Arrangements (Cabinet Regulations nr.1529).

The NHS has 22 officially registered guidelines, with 7 in the priority disease areas of cardiovascular diseases, cancer, mental health, and maternal/perinatal health, including acute coronary syndrome, gynecological oncology, cervical cancer[8], chronic heart failure, colorectal cancer, stroke, and breast cancer.

Hypotheses

Hypothesis 1: The benefits package may be adequate, but limited funding of the package leads to "contract limitations" limiting the quantity supplied of services offered. Also, limited number of specialists practice in the public sector in outlying areas. This results in long queues, high out-of-pocket spending, and significant delays in care.

Hypothesis 2: Limited numbers of specialists (e.g. cardiologists and gastroenterologists) practice in the public sector in outlying areas. This results in long queues, high out-of-pocket spending, and significant delays in diagnosis and care.

Hypothesis 3: There is inadequate funding and coordination of health promotion activities at the national level. No specific funding is earmarked for health promotion at municipal levels. This may explain the low response rate to invitation schemes for disease screening. The absence of health education as a subject for school-aged children exacerbates this situation.

Methodology

The next steps in the review of the benefits package are the following:

1. Review the guidelines endorsed by the NHS and various specialist physician associations. The recommendations outlined in these guidelines will be compared with the services offered by the benefits package to identify gaps.
2. Request additional guidelines from specialist physician associations.
3. Coordinate with the WB data analysis team to evaluate the state of care in the priority disease areas.
4. Carry out qualitative interviews and focus group discussions on service delivery challenges.
    a. Does inadequate health promotion lead to poor uptake of preventive services and healthy lifestyles?

[8] The cervical cancer guideline was developed by East Riga University, while the gynecological oncology guideline (covering cervical cancer, vulvar cancer, ovarian cancer, etc.) was developed by the Latvian Oncology Taskforce.

b. Do contract limitations and long waiting times lead to inadequate delivery of services outlined in the benefits package?
c. What barriers to patients face when trying to access services at the GP and specialist level?
d. What barriers to healthcare providers face when requested diagnostic services and specialist consultations for patients?

9. Other Streams of Work

Service delivery model

Hypothesis 1: There is room to strengthen primary care services for screening, diagnosis, and management of conditions related to cardiovascular diseases, cancer, mental health, and maternal and perinatal health.

Hypothesis 2: There is room to improve coordination of care for all four disease areas across all levels (health promotion and disease prevention, primary care, ambulatory specialist care, emergency care, and inpatient care).

Hypothesis 3: A service delivery model with greater focus on prevention, promotion, and primary care services may better fit Latvia's current disease profile.

Hypothesis 4: For mental health, a move towards a more community-based approach, in which more mental health services are provided in outpatient settings, and hospital stays are as brief as possible, arranged promptly and employed only when necessary, may reduce morbidity and mortality associated with these conditions.

The bottleneck analysis of the data from the NHS payment system, the CDPC disease, birth, and death registries, and SEMS will be used to test whether or not there is empirical support for the first two hypotheses. A review of service delivery models and health outcomes from international experience will be used to provide support for the third and fourth hypotheses.

Health promotion

Hypothesis: Inadequate funding and coordination of health promotion activities at the national level and no specific funding is earmarked for health promotion at municipal levels. This may explain the low response rate to invitation schemes for disease screening. The absence of health education as a subject for school aged children exacerbates this situation. Health

promotion campaigns should target all ages of the population and focus on smoking cessation, reproductive health, nutrition, and physical activity. An integrated national health promotion strategy-- together with clear technical guidelines, designated funding and personnel, and well-designed media campaigns—may contribute to healthy behaviors at the individual level, which is a critical elements for improved health outcomes of the priority diseases.

Provider payment

Hypothesis: The NHS is undertaking a reform on the provider payment system, and Diagnosis-related Group (DRG) payment mechanism has been introduced to a number of health facilities. The provider payment policy and arrangements may have a significant impact on the performance of health professionals and facilities, which may affect timely utilization and quality of care.

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ANNEX 1: COMPONENTS OF THE RAS

Component 1: Identifying and quantifying the importance of key health system bottlenecks

Working with the NHS, the World Bank will use existing data sources and novel surveys to identify and gauge the importance of key health system bottlenecks that contribute to the high disease burdens associated with the four dominant disease groups and conditions. The analysis will focus on a set of tracer conditions representative of the four dominant disease groups and conditions and, where possible and appropriate, will be carried out separately for different population groups defined by income, ethnicity, gender, age, and geographic location.

To meet this objective of this component, the World Bank will complete the following activities:

1. *Desk reviews and key informant interviews to develop hypotheses on key system bottlenecks and their causes within and across all health care levels*

2. *Development of an analytical framework to test these hypotheses with data available from the NHS, Center for Disease Prevention and Control (CDPC), Health Inspectorate (HI), the Central Bureau of Statistics (CBS) and other public sources and a separate survey that captures the provision of services financed from out-of-pocket expenditures*. To assess bottlenecks related to quality of care, we will use existing indicators used by the OECD, the WHO Health for All (HFA) project, and the national framework agreements of selected countries such as Australia, Canada, France, and the United Kingdom. To the extent that existing data sources do not permit measurement of key indicators, we may include modules to capture this variation in the separate facility survey.

    - To assess bottlenecks related to timely utilization of care, we will again use existing indicators and protocols from the OECD, HFA database, and selected countries, with a focus on under-diagnosis (for example, for mental illness), late diagnosis, and coverage of screening. Through the MoH and the Ministry of Finance, we will also seek permission from the Data Protection Agency in Latvia to merge Census data and EU-SILC poverty data with personal identifiers with the billing data of the NHS to assess the extent to which the utilization indicators correlate with socio-economic status.
    -
    - The National Health Service and the Ministry of Health also seek information that can help them characterize the volumes and financial value of privately financed health care services that take place outside of NHS contracts – either

among non-contracted providers, in situations in which a patient wants to avoid a long waiting list, or at times when contracted providers have exceeded their monthly or yearly quota of contracted services. Thus, a separate facility survey will use the universe of hospitals and a sample of general practitioners, specialists, and long-term care facilities to measure the volumes, prices, and patient profiles associated with privately financed services.

3. *An in-depth assessment of hospital performance.* Primary data collection will also be needed to evaluate the current scale and distribution of hospitals, as it may be difficult to achieve certain levels of quality if volumes are low. The proposed surveys would measure procedure volumes and correlate a subset of them with available quality indicators to assess the scope for streamlining of the hospital network and enhancing service quality and efficiency. We will use general indicators of quality such as infection rates, intra-hospital mortality, and readmission rates, as well disease specific indicators from the OECD, HFA database, and protocols from selected countries.

   To the extent that the National Health Service or the Health Inspectorate monitors quality indicators for primary care providers or specialists, a similar analysis can be extended to these other levels of care. Although research has yet to establish a clear relationship between quality and volumes for these levels of care, such an analysis, which has been requested by the client, could be indicative of severe misallocations of infrastructure or personnel.

4. *An in-depth assessment of stocks, distribution, and flows of human resources for health*. Given the uneven distribution of providers across regions and the general aging trend of providers in primary care services, this analysis could help the Ministry of Health pinpoint priority areas for reform (for example, location subsidies, physician waiting list protocols, or mobile health options). Moreover, discussions related to data availability with the NHS, MoH, and CBS suggest that existing data sources may not contain information on full-time equivalent staffing for each physician profile in each facility. Thus, the facility surveys meant to capture information on hospital volumes and privately financed services might also include a module on human resources.

5. *Support to the Ministry of Health in reviewing proposals received from local governments for local health promotion activities*. In particular, the World Bank will provide an overall framework for organizing, funding, and monitoring the effectiveness of promotion activities going forward.

Component 2: Identifying the underlying problems and causes of system bottlenecks

As the analysis uncovers system bottlenecks that underlie the disease burden associated with the four dominant disease groups and conditions, a series of qualitative studies related to system design and system inputs will help deepen the analysis of bottlenecks and identify their underlying causes. To achieve this level of understanding, the World Bank will complete the following activities:

1. *Policy, practice, and capacity review (including international benchmarking) for key health system functions.* Experts will travel to Latvia to gather the information required to review the current state of benefits design and health technology assessment, the organization of service delivery (including clinical pathways), quality assurance (including clinical guidelines), provider payments (including the costing system), human resource and capital investment planning, and information management (e-health).

2. *Key informant interviews and focus group discussions* (with specialists for the four high burden disease groups and conditions, general practitioners, nurses, and patients). Hypotheses generated by the quantitative analyses from Component 1 will inform the design, content, and scope of these interviews.

Component 3: Identifying policy solutions to address underlying causes of observed system bottlenecks.

With the data and information generated by the first two components, the World Bank will work with the NHS to identify policy solutions under an envelope of realistic budget allocations from the state to address the underlying causes of observed system bottlenecks driving the burden of priority diseases and conditions. Under this component, the proposed analytical outputs also aim to provide tools to drive implementation of any proposed reforms.

In particular, the World Bank will complete the following activities:

1. *Development of infrastructure and human resource maps* and estimates of fiscal impacts and gaps under alternative service delivery scenarios. These maps would use information produced under Components 1 and 2 of the proposed study (the hospital and facility surveys and the assessments of human resources, capital investment, benefits package design, and the organization of service delivery), and they have been explicitly requested by the Ministry of Health. They will provide the information required to prioritize their future infrastructure and human resource investments funded through the European Commission and a plan for maintaining similar data collection activities and assessments in the future.

2. *Reviews of alternative policy options and implementation lessons from other contexts (e.g. EU, OECD countries)* for addressing the identified underlying problems and causes of system bottlenecks;

3. *A workshop hosted by World Bank with the MoH and NHS* to review and prioritize among system bottlenecks, underlying causes, and policy entry points and to learn about international best practices.

4. *Policy proposals to strengthen priority health functions*, including critical design features for benefits design and organization of health service delivery (including clinical guidelines), capital and human resource planning, and provider payments. These proposals would take into account both the policy reviews and the joint workshop with the MoH and the NHS and would offer a realistic "game plan" for transforming proposals on paper into concrete policy action in practice.

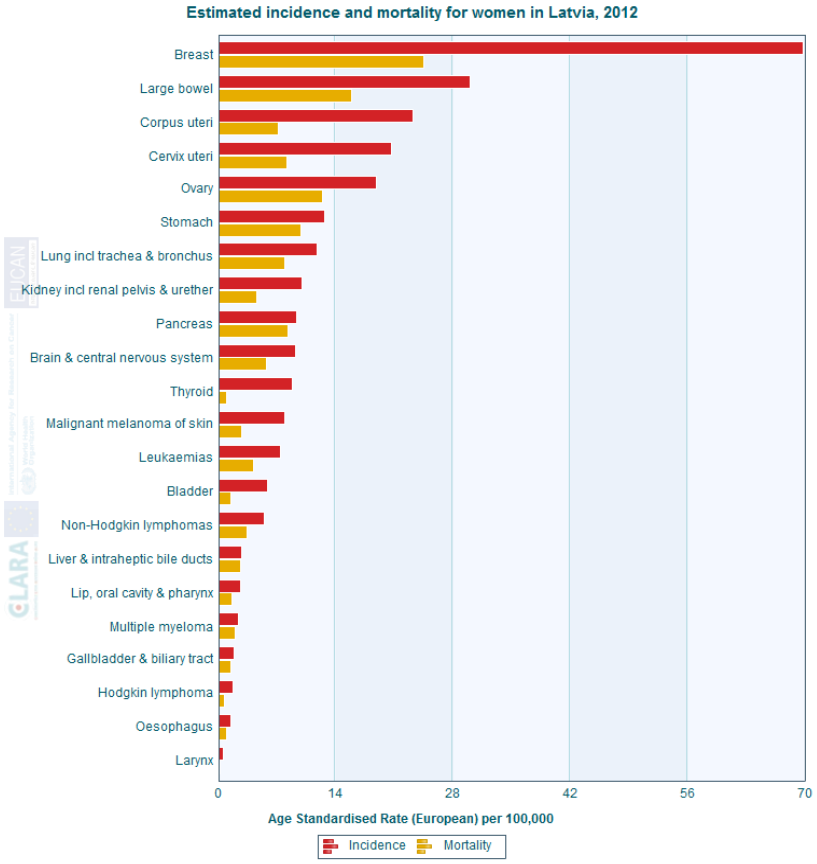
5. *Support to the NHS and MoH in validation and dissemination of findings among stakeholders.* This will take place through a series of workshops in Latvia, an academic conference, and publication through World Bank discussion series.

ANNEX 2: IDENTIFYING TRACER CONDITIONS FOR CANCER

In this Annex, we investigate the incidence and mortality rates of the most common cancer diagnoses in men and women in Latvia. We used this information to inform our choice of tracer conditions.

Among women, the most common cancers among women are gynecological cancers (Figure 8). Breast cancer has both the largest incidence and mortality rates in Latvia, while colorectal cancer accounts for the second-highest incidence and mortality rates. At the same time, ovarian and cervical cancer incidence in the country are among the highest rates in the European Union. (Table 8)

Figure 8: Incidence and mortality of the most common cancer diagnoses in women, Latvia 2012[9]



Source: EUCAN, 2012. International Agency for research in cancer based on (Bray, Lortet-Tieulent et al. 2010; Ferlay, Steliarova-Foucher et al. 2013)

[9] Age standardized rates (ASRs) (per 100,000). Incidence is the number of new cases for the indicated period, expressed per 100,000 persons after age standardization.

Table 8: Incidence and mortality rates for select cancers in women, Latvia, 2012

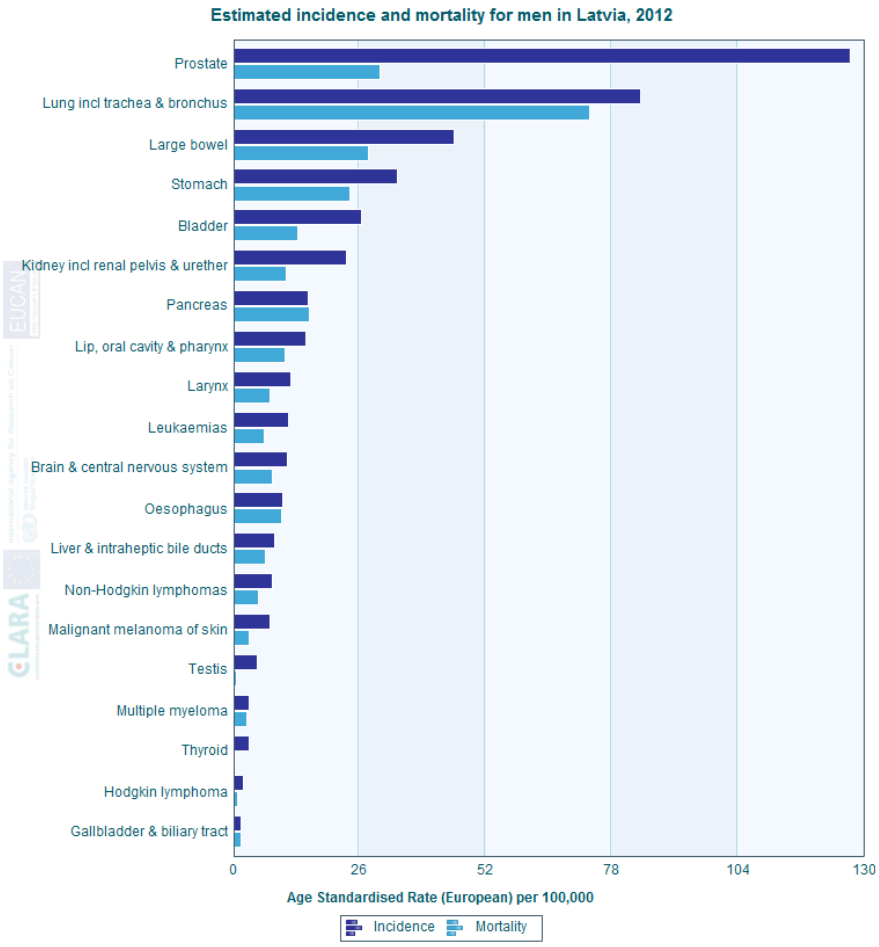
	Incidence rate	Mortality rate	Rank (40 EU)[10]
Ovarian cancer	18.9	12.4	1
Cervical cancer	20.7	8.2	8
Gastric cancer	12.6	9.8	8
Uterine cancer	23.2	7.1	11
Breast cancer	69.8	24.5	32

Source: Ferlay, Steliarova-Foucher et al., 2013

Among men, prostate, lung and colorectal cancers are the most commonly diagnosed malignancies and also account for the largest mortality. (**Error! Not a valid bookmark self-reference.**)(Ferlay, Steliarova-Foucher et al. 2013) Along with other Baltic countries (Estonia and Lithuania), Latvia has one of the highest gastric, kidney and lung cancer mortality rates among European Union countries. (Table 9) (Bray, Lortet-Tieulent et al. 2010; Plonis, Bokums et al. 2014)

[10] Rank among 40 European Union countries in terms of age-stnadardized incidence rates, with 1 indicating the highest incidence. With exception of breast cancer the cancers included in the table are cancers on which Latvia was ranked among the first 15.

Figure 9: Incidence and mortality of the most common cancer diagnoses in men, Latvia 2012[11]



Source: EUCAN, 2012. International Agency for research in cancer based on (Bray, Lortet-Tieulent et al. 2010; Ferlay, Steliarova-Foucher et al. 2013)

Table 9: Incidence and mortality of select cancers in men, Latvia, 2012

	Incidence rate	Mortality rate	Rank (40 EU)
Gastric cancer	33.7	24	5
Kidney cancer	23.3	10.9	5
Pancreatic cancer	15.4	15.6	6
Oesophageal cancer	10.1	9.8	6
Lung cancer	83.9	73.4	7
Prostate cancer	127.2	30.2	11

[11] Age standardized rates (ASRs) (per 100,000). Incidence is the number of new cases for the indicated period, expressed per 100,000 persons after age standardization.

Source: Ferlay, Steliarova-Foucher et al., 2013

Based on the above information, the following candidate tracer conditions were identified: breast cancer, colorectal cancer, prostate cancer, and lung cancer. (Table 10) Prostate cancer was not included in the set of tracer indicators because it affects relatively older populations[12] and accounts for a relatively lower share of the population-based burden of disease.[13] Lung cancer was not included in the set of tracer conditions because there are no established screening protocols. In addition, the most common cause of lung cancer is smoking, and an analysis of lung cancer mortality would require an analysis of smoking patterns, which is beyond the scope of this study.[14]

Table 10: Selection of tracer cancer conditions

Type of cancer	Considerations	Included?
Breast cancer	Highest incidence and mortality among women	Yes
Cervical cancer	Relatively high incidence and mortality among women Established screening protocols	Yes
Colorectal cancer	Second highest incidence and mortality among women Second highest incidence and mortality among men	Yes
Prostate cancer	Highest incidence and mortality among men Mostly affects older men	No
Lung cancer	Second highest incidence and mortality among men Medium high incidence and mortality among women No established screening protocols Limited treatment options	No

[12] The mean age at diagnosis is 70.1 years.
Source: http://www.sciencedirect.com/science/article/pii/S1010660X14001086
[13] http://www.healthdata.org/sites/default/files/files/country_profiles/GBD/ihme_gbd_country_report_latvia.pdf
[14] http://onlinelibrary.wiley.com/doi/10.1002/ijc.20019/pdf

ANNEX 3: DATA REQUEST

Support to Develop a Health System Strategy for Priority Disease Areas in Latvia

Reimbursable Advisory Services to the National Health Service, Latvia

Request for Data

March 2, 2015

Prepared by: World Bank Team

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Contents of the data request:

1. A summary table of all databases requested: pages 3-10 of this file.
2. A Microsoft Excel file “Request NHS_v1.xlsx”: contains a list of databases and respective variables that the World Bank team is requesting from NHS.
3. A Microsoft Excel file “Request CPDC_v1.xlsx”: contains a list of databases and respective variables that the World Bank team is requesting from CPDC.
4. A Microsoft Excel file “Request CBS_v1.xlsx”: contains a list of databases and respective variables that the World Bank team is requesting from CBS.
5. A Microsoft Excel file “Request SBM_v1.xlsx”: contains a list of databases and respective variables that the World Bank team is requesting from State Board of Medicines (SBM).
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Requests regarding identifiers in the databases:

1. Individual person IDs (whether patients or medical care providers) will need to be encrypted. The World Bank team kindly requests that an NHS database/ IT specialist be designated to support the encryption of this information at NHS, CDPC, CBS, MOH, to ensure that all use the same encryption protocol and all encrypted databases can be linked.
2. After reviewing the content of the different datasets, the World Bank team concluded that it may not be worthwhile trying to encrypt the ID codes of medical *institutions*. This is because even if information is encrypted, many medical care institutions could be identified based on their procedural volumes and case mixes. The data analysis will not present data in a disaggregated form at the medical institution level, so the institutions will not be “exposed”, even if the institution IDs are not encrypted.

Proposed next steps:

1. Review of request by concerned institutions;
2. Video-conferences to clarify any questions regarding the data request;
3. Video-conference with NHS/MOH to discuss strategy to collect information o privately funded services.

Data Request Summary Table

Institution	Database	Variables	Timeline	Comments	Users
NHS	Inpatient payment database	All tables and variables provided in the extract Person ID encrypted Institution ID non-encrypted Physician ID encrypted	2009-2014	See "Request NHS.xls" file for list of variables	Ana Milena Aguilar Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Outpatient payment database	All variables provided in the extract Person ID encrypted Institution ID non-encrypted Physician ID encrypted	2009-2014	See "Request NHS.xls" file for list of variables	Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Prescription data	All variables provided in the extract Person ID encrypted Institution ID non-encrypted Physician ID encrypted	2009-2014	See "Request NHS.xls" file for list of variables	Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
	Insured persons list	Insured person ID (encrypted), GP affiliation (encrypted physician ID), municipality, year of birth, gender, fee exemption status, move into and out of the database	2009-2014 (if by year, then as of Jan 1)	This would be the list of persons that are affiliated (registered) with NHS, with basic information on each person. We did not request an extract from this database. Questions: How does NHS compile its list of affiliates? In particular: how do persons get added or dropped from the list? What is the relationship between the population registry and the NHS list of affiliates? How often does NHS update births and deaths? How is this list structured?	Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Invitation letters breast cancer screening	Personal ID (encrypted), date that the invitation letter was sent	2009-2014	Data extract only has year of sending. We would need the day/month/year the letter was sent.	Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Invitation letters cervical cancer screening	Personal ID (encrypted), date that the invitation letter was sent	2009-2014	Data extract only has year of sending. We would need the day/month/year the letter was sent.	Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Invitation letters colorectal cancer screening	Personal ID (encrypted), date that the invitation letter was sent	2009-2014	Data extract only has year of sending. We would need the day/month/year the letter was sent.	Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Incentive payments for primary health care	All variables, GP ID (encrypted), institution ID (non-encrypted)	2014	Information on NHS incentive payments for primary health care, e.g. to nurses and medical assistants; rural areas bonuses	Edson Correa Araujo Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
	GP performance indicators	GP ID (encrypted), score on 13 performance indicators that are related to payment of bonuses	2014	Question: Are the quality indicators collected for specialists as well?	Edson Correa Araujo Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Contract data for State, Regional and Local hospitals	As per the provided extract: Institution ID (non-encrypted), identifiers for state/regional/local hospital, service/program code (PP Nrpk), service/program description, tariff, number of patients, state fee for service, planned patient copay paid by state	2009-2014	This table lists the quotas by service provided. Question: is there a corresponding table with the number of services actually dispensed by the hospital?	Ana Milena Aguilar Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
NHS/MOH	Non contracted inpatient and outpatient services in State, regional and local hospitals	As many fields as possible to replicate the NHS inpatient database - ie. Information at the patient level on all services received and billed for to the patient or private insurance, diagnosis code, etc. Non-encrypted hospital/institution ID	2009-2014	Might require a data collection exercise with the concerned hospitals. Riga East hospital has indicated that this information is available in their system. Prioritize Gailezers/Riga East hospital, Pauls Stradins Hospital --- and others offering oncology programs	Ana Milena Aguilar Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
NHS/MOH	Non contracted outpatient visits and diagnostic tests outside of hospitals	Encrypted ID, date of visit, specialist type, diagnosis	2009-2014	Might require a data collection exercise with the concerned hospitals. (Will need to prioritize the biggest players in the market) Need this for privately paid diagnostic tests, privately paid outpatient specialist visits	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch
MoH	Private revenue of hospitals	Hospital ID (non-encrypted), total earned funds, funds earned from paid health services, funds earned from other operating income, revenue earned from endoprosthetics with 50 % payment	2009-2014	Data extract received.	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
State Medicine Board	Medicine sales	Amount of medicines sold by wholesalers, by type of buyer (retail pharmacies or hospitals) Product no, product name, quantity, sales price, consignee, package size	2009-2014	List of key medicines for each of the four tracer condition groups has been determined. See excel file Request SBM_v1.xlsxm, sheet “summary”. Please clarify whether "quantity" is the number of consumer packages, or wholesale packages. Clarify whether package in "package size" is the consumer package, even in the wholesale database. Please clarify what are sales when the consignee is the practitioner - are practitioners allowed to sell or distribute medications?	Lucas Gortazar Marvin Ploetz Christel Vermeersch
CDPC	Birth registry	All variables, encrypted person ID to be included Do not encrypt institution ID	2009-2014	Need a soft copy of the physical form See “Request CPDCS.xls” file for list of variables.	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Death registry	All variables, encrypted person ID to be included Do not encrypt institution ID	2009-2014	Need a soft copy of the physical form. See “Request CPDCS.xls” file for list of variables.	Ana Milena Aguilar, Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Cancer registry	All variables, encrypted person ID to be included Do not encrypt institution ID	2009-2014	Need a soft copy of the physical form. See “Request CPDCS.xls” file for list of variables.	Ana Milena Aguilar Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
	Diabetes registry	All variables, encrypted person ID to be included Do not encrypt institution ID	2009-2014	Need a soft copy of the physical form. See "Request CPDCS.xls" file for list of variables.	Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Mental health registry	All variables, encrypted person ID to be included Do not encrypt institution ID	2009-2014	Need a soft copy of the physical form. See "Request CPDCS.xls" file for list of variables.	Ana Milena Aguilar Rivera Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Drug abuse registry	All variables, encrypted person ID to be included	2009-2014	Need a soft copy of the physical form. See "Request CPDCS.xls" file for list of variables.	Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Registry of health professionals	All variables Encrypted physician ID Non-encrypted institution ID	2009-2014	Question 1: is there a separate table for inpatient and outpatient main places of work? If a provider works both in a hospital and in an outpatient setting, how would his/her information appear? Question 2: Is this collected by CDPC or Health inspectorate?	Edson Correa Araujo Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Registry of health institutions	All variables Non-encrypted institution ID	2009-2014	Data extract was provided. See "Request CPDCS.xls" file for list of variables.	Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
	Procedure volume database	Non-encrypted institution ID, Per procedure: volume of patients/procedures paid by NHS, volume of patients/procedures not paid by NHS	2009-2014	We don't have an extract to be able to list the variables. Include both privately and NHS financed procedures.	Ana Milena Aguilar Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Database of Hospital Beds utilization	All variables, medical institution ID (non-encrypted), clinical department, type of hospital (MoH, Local , Private, etc), region, bed occupancy, bed profile, case fatality rate and associated operation, bed turnover, bed-days, Disaggregated by: Diagnosis group SSK-10, surgery operation group (the most disaggregated possible)	(or years available)	We don't have an extract to be able to list the variables.	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Hospital work database	Medical institution ID (non-encrypted), clinical department, number of laparoscopies, C-sections, angiographies, manipulation information.		We are looking for the database that provided the information published in “Report of hospital work- a state statistical report” (Valsts statistikas parskats) and in “report of radiology”).	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
SEMS	Database of patient emergency transport	Patient ID (encrypted), date of emergency transportation, primary reason for emergency transportation (diagnosis code?), secondary diagnosis code, ID of admitting facility (non-encrypted)	2011-2014		Lucas Gortazar Marvin Ploetz Christel Vermeersch
SMC	Database of patient transport between hospitals	ID of discharge and admitting facility (non-encrypted), patient ID (encrypted), primary diagnosis, reason for transportation, type of service required by patient	2011-2014 (SEMS) 2012-2014 (SMC)		Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch
NHS (web page information) SEMS	Database on operational/non-operational hospital departments	All variables Hospital ID (non-encrypted)	2013-2014 (SEMS)	Information from NHS web page is available at: http://www.vmnvd.gov.lv/lv/503-ligumpartneriem/ligumu-paraugi/stacionaro-veselibas-aprupes-pakalpojumu-liguma-paraugs SEMS gathers the information about operational/non-operational hospital departments since 2013. This information is provided by hospitals to SEMS.	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
SMC	Database on SMC specialist departures to hospitals	Departures to hospitals after call from hospital to perform consultation / operation/transfer All variables Hospital ID (non-encrypted)	2011-2014	Hospital requests for medical support from SMC specialist or SMC brigade who after the call from Hospital departs to the Hospital to consult / operate or transfer the patient to the University hospital.	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch
HI					
CBS	Census	Encrypted person ID, education, household size, type of employment, identification of encrypted IDs of household members.		Received the census data collection form. Sent preliminary list of variables to be included in the data request as well as variables that we will receive from other sources, for initial discussion See excel file “Request CBS_v3.xlsx”.	Ana Milena Aguilar Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Eurostat health survey (household)	Check the eurostat website for variables All variables, anonymized		Currently underway, data to be available in November 2014	Amit Chandra Lucas Gortazar Marvin Ploetz Christel Vermeersch
	Tax data	Encrypted person ID, Taxable income	Aggregated at the yearly level	CBS has information from the state revenue agency. Contrary to data from other agencies, they have a special arrangement with tax authority about sharing the data without further authorization from tax authority. Have monthly data Would need to be able to identify household members using encrypted IDs	Edson Correa Araujo Lucas Gortazar Marvin Ploetz Christel Vermeersch

Institution	Database	Variables	Timeline	Comments	Users
	Labor force survey	All available variables, anonymized	Latest available	Have questionnaire	Edson Correa Araujo Lucas Gortazar Marvin Ploetz Christel Vermeersch
Ministry of Welfare	SOPA database	Encrypted person ID, beneficiary status	2009-2014		Lucas Gortazar Marvin Ploetz Christel Vermeersch

ANNEX 4: DIRECTORY OF INDICATORS FOR CANCER TRACER CONDITIONS

Indicator number	**C1**
Indicator	**% of NHS cancer spending that occurs in the last 30/90 days of life**
Tracer	All cancers
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	NHS payments for patients in the death registry (?) within 30/90 days of death, for whom cause of death has an ICD code related to cancer.
Denominator	All NHS spending on cancer (how to define?)
Source of Data 1	NHS payments data
Source of Data 2	Death register
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	
Assumptions	Most patients with late stage disease die as a result of the cancer and not from a comorbidity or external cause. Absence of palliative/comfort/community care leads to inappropriate and expensive care for patients with late stages of cancer.
Additional tests	In the death registry: check whether all persons who are registered to have died from a cancer related cause, were in the cancer registry
Notes 1	ICD 10 code for the reason of death has to be from a cancer category.
Notes 2	If we base our numerator and denominator "spending on cancer patients', rather than "spending on cancer", we might count unrelated expenses on cancer patients as part of cancer expenses. Need to assign spending of GP offices to cancer patients - eg. fixed payments to GP practices and capitation payments to GP
References	

Indicator number	**C2**
Indicator	**Percentage of breast cancers diagnosed at Stage I (benchmark countries have been identified)**
Tracer	Breast cancer
Pathway time	Conditional on diagnosis
Block	Timeliness
Hypothesis	Delays between diagnosis and treatment
Sub-hypothesis	
Numerator	Breast cancer cases diagnosed in year t at stage I
Denominator	Breast cancer cases diagnosed in year t
Source of Data 1	Cancer registry
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	ICD-10 code for breast cancer is C50. Include all sub-codes, C50.0-C50.929.
Notes 2	Benchmark countries: Canada (43.9%) Denmark (30.1%) Norway (44.5%) Sweden (45.2%) Source: http://www.nature.com/bjc/journal/v108/n5/full/bjc20136a.html
References	

Indicator number	**C3**
Indicator	**Time elapsed between diagnosis and onset of treatment (radiation onc., chemo, surgery)**
Tracer	Breast cancer
Pathway time	Conditional on diagnosis
Block	Timeliness
Hypothesis	Delays between diagnosis and treatment
Sub-hypothesis	
Numerator	Date of onset of treatment (as per cancer registry) minus date of diagnosis (as per cancer registry)
Denominator	None
Source of Data 1	Cancer registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	Codes for surgery? What are they?
Outstanding clarification questions	Does date of therapy indicate the first therapeutic intervention? (eg. surgery, first chemo, first radiation) How are chemo and radiation codified?
Assumptions	Private providers register their patients in the cancer registry
Additional tests	Is there a delay between first appearance of the ICD-10 diagnosis code in the payment data, and the registration of the code in the cancer registry?
Notes 1	
Notes 2	
References	

Indicator number	**C4**
Indicator	**% of visits with only diagnosis of breast cancer that take place at the GP level**
Tracer	Breast cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Number of GP visits whose only ICD-10 diagnosis code is breast cancer
Denominator	Total number of visits whose only ICD-10 diagnosis code is breast cancer
Source of Data 1	
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	What is the role of the GP in diagnosis and management of cancer patients? What would be a benchmark on this indicator?
Assumptions	GP is not in charge of coordination of care for cancer patients
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C5**
Indicator	**Direct referrals from GP to treatment**
Tracer	Breast cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Cases of initiation of treatment where referring physician is a GP
Denominator	All cases of initiation of treatment
Source of Data 1	NHS payment data
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Are GPs allowed to do a direct referral for radiation or chemo? If GPs are NOT allowed to do direct referral for radiation or chemo, and we find no cases, then we can drop the indicator and make a statement that the rule is being followed.
Assumptions	GPs are not trained to decide on proper course of treatment for a cancer patient and should not be the primary referring physician for treatment.
Additional tests	
Notes 1	Any significant positive number would be bad.
Notes 2	
References	

Indicator number	**C6**
Indicator	**% of diagnosed patients with at least one visit with an oncologist within 90 days**
Tracer	Breast cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Patients diagnosed with at least one visit within 90 days
Denominator	Number of patients diagnosed
Source of Data 1	Cancer Registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	How does the "end of treatment" / "sign off" appear in the databases? Need the date of death or remission as an end point. Why are patients removed from the register? Are they removed upon remission? What happens if patients relapse after being dropped from the registry? Are they being put in in the same line or in a new line?
Assumptions	Patients with an active cancer diagnosis should see an oncologist at least once every 90 days. What about patients who are diagnosed with late-stage disease and only receive comfort/palliative care? Do they remain on the registry?
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C7**
Indicator	**% of women aged 20 and older receiving annual well check**
Tracer	Breast cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	Insufficient annual visits
Numerator	Women aged 20+ receiving annual check.
Denominator	Women aged 20+
Source of Data 1	NHS Payment Data
Source of Data 2	NHS Patient Registry (denominator)
Source of Data 3	
ICD and/or Manipulation codes	Manipulation Code to be identified
Outstanding clarification questions	Need to understand content of the reports on privately financed services
Assumptions	Many annual well checks are provided outside the NHS scheme.
Additional tests	
Notes 1	Complement the NHS data with facility reports on number of services provided that were privately financed. This should allow us to compute the overall indicator. However, we would not be able to link the use of prevention services to actual cancer cases. Need more clarity on availability of information for services provided by individual providers, privately financed.
Notes 2	High probability that we would not be able to reliable estimate this indicator.
References	Healthindicators.gov

Indicator number	**C8**
Indicator	**% of women aged 50-69 receiving 2 -yearly screening mammograms (EU guideline)**
Tracer	Breast cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	
Numerator	Number of women age 50 to 69 as of 31 Dec 2014 who had a mammogram in 2013 or 2014
Denominator	Total women aged 50-69 as of 31 Dec 2014
Source of Data 1	NHS Payment data
Source of Data 2	NHS Patient Registry (denominator)
Source of Data 3	
ICD and/or Manipulation codes	Manipulation Code to be confirmed (50096)
Outstanding clarification questions	Does the NHS pay for mammograms that are provided by the mobile vans or other private sector entities? Confirm that there are no quotas for mammograms.
Assumptions	Few privately financed mammograms. Or: facility reports adequately reflect the number of privately financed mammograms.
Additional tests	
Notes 1	Need to check whether OECD/EU have guidelines on how to calculate this indicator - eg. exclude women under active treatment for breast cancer
Notes 2	
References	

Indicator number	**C9**
Indicator	**% of women receiving invitation letters who receive a mammogram by end of the following calendar year (CY)**
Tracer	Breast cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	Invitation letter scheme not succesful at getting women in for screening.
Numerator	Women who receive invitation letter in year t AND receive a mammogram by end of year t+1
Denominator	Women who receive invitation letter in year t
Source of Data 1	Database on Invitation letters for Screening & NHS Payment Data
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	Manipulation Code to be confirmed (50096)
Outstanding clarification questions	Does the NHS pay for mammograms that are provided by the mobile vans or other private sector entities? Confirm that there are no quotas for mammograms.
Assumptions	Women who receive an invitation letter are due for a mammogram, ie. Have not had a mammogram within the last 2 years. Few privately financed mammograms. Or: facility reports adequately reflect the number of privately financed mammograms.
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C10**
Indicator	**Percentage of Women with diagnosis of Stage I, II or III breast cancer, who underwent a sentinel lymph node biopsy or axillary lymph node dissection.**
Tracer	Breast cancer
Pathway time	Conditional on Diagnosis
Block	Quality
Hypothesis	Inaccurate diagnosis leads to suboptimal treatment
Sub-hypothesis	Inaccurate staging leads to suboptimal treatment
Numerator	Women with diagnosis of Stage I, II or III breast cancer who underwent a sentinel lymph node biopsy or axillary lymph node dissection.
Denominator	Women with diagnosis of Stage I, II or III breast cancer
Source of Data 1	NHS payment data
Source of Data 2	Cancer registry (denominator)
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Confirm manipulation codes for sentinel lymph node biopsy and axillary lymph node dissection. (29183 or 20041 or 54009, plus check NOMESCO codes for dissection)
Assumptions	
Additional tests	
Notes 1	Need opinion from Latvian oncologist on adequacy of indicator.
Notes 2	
References	

Indicator number	**C11**
Indicator	**% of women receiving invitation letters who receive a Pap smear by end of the following CY**
Tracer	Cervical Cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	Invitation letter scheme not succesful at getting women in for screening.
Numerator	Women who receive invitation letter in year t AND receive a pap smear by end of year t+1
Denominator	Women who receive invitation letter in year t
Source of Data 1	Database on Invitation letters for Screening & NHS Payment Data
Source of Data 2	may need laboratory data to cross check
Source of Data 3	
ICD and/or Manipulation codes	Manipulation Codes: 42026-42033
Outstanding clarification questions	
Assumptions	Women who receive an invitation letter are due for a pap smear, ie. Have not had a Pap smear within the last 3 years. Facility reports adequately reflect the number of privately financed pap smears.
Additional tests	
Notes 1	If percentage of pap smears in outpatient private setting is high, we would not be able to measure this indicator.
Notes 2	ICD-10 code for cervical cancer is C53. Include all sub-codes, C53.0-
References	

Indicator number	**C12**
Indicator	**Percent of target population receiving the HPV vaccine**
Tracer	Cervical Cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	
Numerator	Female 13 year olds as of December 31, 2014 who received 3 doses of the HPV vaccine over 2013 and 2014
Denominator	Female 13 year olds as of December 31, 2014
Source of Data 1	NHS Payment Data
Source of Data 2	NHS Patient Registry
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Amit to Confirm Age group. Manipulation Codes are 60335-60337..
Assumptions	
Additional tests	Check the recommended age range for administration of this vaccine: wikipedia says target age range is 12 - then take 13 year olds by December 31, 2014 and see if they received the vaccine in 2013 or 2014.
Notes 1	Would prefer to use an official statistic if available, since this indicator would not be used for the patient pathways anyways.
Notes 2	
References	

Indicator number	**C13**
Indicator	**% of women age 30-60 screened for cervical cancer at least once within the last 5 years (modified EU QA in cervical cancer screening)**
Tracer	Cervical Cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of timely screening in 5-year periods
Sub-hypothesis	
Numerator	Women aged 31-60 as of December 2014, who had a Pap smear in 2014, 2013, 2012, 2011 or 2010
Denominator	Women aged 31-60 as of December 2014
Source of Data 1	NHS Payment Data
Source of Data 2	NHS Patient Registry
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Unsure whether manipulation codes can be uniquely defined Manipulation code: seems to be differentiated according to the result: confirm whether this is the case
Assumptions	
Additional tests	
Notes 1	Theoretically need to exclude women who had hysterectomies - how to determine the estimated percentage of women who had this procedure previously? How to determine privately financed provision of Pap smears? Do private providers bill NHS for Pap smears provided. ? How concentrated is the laboratory segment for analysis of Pap smears? If market is less than 10 providers, we could do a quick survey to check how many Pap smear readings each lab does per year. Do labs know whether Pap smears are privately or publicly financed? How do we know whether women had multiple Pap smears in a 5 year span if we only have aggregate number of Pap smears?
Notes 2	
References	

Indicator number	**C14**
Indicator	**Percentage of cervical cancers diagnosed at Stage I (benchmark countries identified)**
Tracer	Cervical Cancer
Pathway time	Conditional on diagnosis
Block	Timeliness
Hypothesis	Delays between diagnosis and treatment
Sub-hypothesis	
Numerator	Cervical cancer cases diagnosed in year t at stage I
Denominator	Cervical cancer cases diagnosed in year t
Source of Data 1	Cancer registry
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	Benchmark countries are: UK (75%) Source: http://www.nature.com/bjc/journal/v109/n4/full/bjc2013412a.html Czech Republic (47-49%) Source: cervix.cz
Notes 2	
References	

Indicator number	**C15**
Indicator	**Time elapsed between diagnosis and onset of treatment (radiation onc., chemo, surgery)**
Tracer	Cervical Cancer
Pathway time	Conditional on diagnosis
Block	Timeliness
Hypothesis	Delays between diagnosis and treatment
Sub-hypothesis	
Numerator	Date of onset of treatment (as per cancer registry) minus date of diagnosis (as per cancer registry)
Denominator	None
Source of Data 1	Cancer registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Codes for surgery? What are they? Does date of therapy indicate the first therapeutic intervention? (eg. surgery, first chemo, first radiation) How are chemo and radiation codified?
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C16**
Indicator	**% of visits with only diagnosis of cervical cancer that take place at the GP level**
Tracer	Cervical Cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Number of GP visits whose only ICD-10 diagnosis code is cervical cancer
Denominator	Total number of visits whose only ICD-10 diagnosis code is cervical cancer
Source of Data 1	Cancer registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	What is the role of the GP in diagnosis and management of cancer patients? What would be a benchmark on this indicator?
Assumptions	GP is not in charge of coordination of care for cancer patients
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C17**
Indicator	**Direct referrals from GP to treatment**
Tracer	Cervical Cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Cases of initiation of treatment where referring physician is a GP
Denominator	All cases of initiation of treatment
Source of Data 1	NHS payment data
Source of Data 2	Cancer registry
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Are GPs allowed to do a direct referral for radiation or chemo? If GPs are NOT allowed to do direct referral for radiation or chemo, and we find no cases, then we can drop the indicator and make a statement that the rule is being followed.
Assumptions	GPs are not trained to decide on proper course of treatment for a cancer patient and should not be the primary referring physician for treatment.
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C18**
Indicator	**% of diagnosed patients with at least one visit with an oncologist within 90 days**
Tracer	Cervical Cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Patients diagnosed with at least one visit within 90 days
Denominator	Number of patients diagnosed
Source of Data 1	Cancer Registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	How does the "end of treatment" / "sign off" appear in the databases? Need the date of death or remission as an end point. Why are patients removed from the register? Are they removed upon remission? What happens if patients relapse after being dropped from the registry? Are they being put in in the same line or in a new line?
Assumptions	Patients with an active cancer diagnosis should see an oncologist at least once every 90 days. What about patients who are diagnosed with late-stage disease and only receive comfort/palliative care? Do they remain on the registry?
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C19**
Indicator	**Indicator for accuracy of staging**
Tracer	Cervical Cancer
Pathway time	Conditional on Diagnosis
Block	Quality
Hypothesis	Inaccurate diagnosis leads to suboptimal treatment
Sub-hypothesis	
Numerator	
Denominator	
Source of Data 1	
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	Staging of cervical cancer is different from other cancers. FIGO classification: Stage I localized, II: beyond cervix and uterus, III: walls of pelvis/vagina, III: other organs Ask Latvian oncologist for input on possible indicators
Notes 2	
References	

Indicator number	**C20**
Indicator	**% of people receiving invitation letters who receive FOBT by end of the following CY**
Tracer	Colo-rectal Cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	Invitation letter scheme not succesful at getting people in for screening.
Numerator	Patients who receive invitation letter in year t AND receive a FOBT by end of year t+1
Denominator	People who receive invitation letter in year t
Source of Data 1	Database on Invitation letters for Screening & NHS Payment Data
Source of Data 2	may need laboratory data to cross check
Source of Data 3	
ICD and/or Manipulation codes	Manipulation Codes: 40161
Outstanding clarification questions	
Assumptions	People who receive an invitation letter are due for a FOBT, ie. Have not had a FOBT within the last 10 years (CHECK). Facility reports adequately reflect the number of privately financed FOBTs.
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C21**
Indicator	**% of 50-74 year olds receiving FOBT within the last year (EU QA guideline for colorectal cancer screening)**
Tracer	Colo-rectal Cancer
Pathway time	Promotion and Prevention
Block	--
Hypothesis	Lack of screening
Sub-hypothesis	
Numerator	50-74 year olds receiving at least one FOBT a year
Denominator	Total patients 50-74 year old
Source of Data 1	
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	Manipulation Codes: 40161
Outstanding clarification questions	Confirm that this should be done ever year
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	C22
Indicator	**Staging of cancer when diagnosis first made (benchmark countries identified)**
Tracer	Colo-rectal Cancer
Pathway time	Conditional on diagnosis
Block	Timeliness
Hypothesis	Delays between diagnosis and treatment
Sub-hypothesis	
Numerator	Colo-rectal cancer cases diagnosed in year t at stage I
Denominator	Colo-rectal cancer cases diagnosed in year t
Source of Data 1	Cancer registry
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	Need input from a Latvian oncologist on appropriate tests to stage the cancer. Benchmark countries are: Canada (42.5%) Denmark (36.4%) Normway (19.4%) Sweden (47.1%) UK (47.1%) Source: http://www.ncbi.nlm.nih.gov/pubmed/23581611
Notes 2	ICD-10 code for colo-rectal cancer is C18. Include all sub-codes, C18.0- Recto-sigmoid: C19 Rectum: C20 Carcinoid tumor of appendix, large intestine, rectum: C7A.02.Include all sub-codes, C7a.020-C7a.029
References	

Indicator number	**C23**
Indicator	**Time elapsed between diagnosis and onset of treatment**
Tracer	Colo-rectal Cancer
Pathway time	Conditional on diagnosis
Block	Timeliness
Hypothesis	Delays between diagnosis and treatment
Sub-hypothesis	
Numerator	Date of onset of treatment (as per cancer registry) minus date of diagnosis (as per cancer registry)
Denominator	None
Source of Data 1	Cancer registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Codes for surgery? What are they? Does date of therapy indicate the first therapeutic intervention? (eg. surgery, first chemo, first radiation) How are chemo and radiation codified?
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C24**
Indicator	**Any direct referrals from GP to treatment**
Tracer	Colo-rectal Cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Cases of initiation of treatment where referring physician is a GP
Denominator	All cases of initiation of treatment
Source of Data 1	NHS payment data
Source of Data 2	Cancer registry
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	Are GPs allowed to do a direct referral for radiation or chemo? If GPs are NOT allowed to do direct referral for radiation or chemo, and we find no cases, then we can drop the indicator and make a statement that the rule is being followed.
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C25**
Indicator	**% of diagnosed patients with at least one visit with an oncologist within 90 days**
Tracer	Colo-rectal Cancer
Pathway time	Conditional on diagnosis
Block	Coordination and level
Hypothesis	Lack of coordination and integration of care
Sub-hypothesis	
Numerator	Patients diagnosed with at least one visit within 90 days
Denominator	Number of patients diagnosed
Source of Data 1	Cancer Registry
Source of Data 2	NHS payment data
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	How does the "end of treatment" / "sign off" appear in the databases? Need the date of death or remission as an end point. Why are patients removed from the register? Are they removed upon remission? What happens if patients relapse after being dropped from the registry? Are they being put in in the same line or in a new line?
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**C26**
Indicator	**? Indicator for accuracy of staging**
Tracer	Colo-rectal Cancer
Pathway time	Conditional on Diagnosis
Block	Quality
Hypothesis	
Sub-hypothesis	
Numerator	
Denominator	
Source of Data 1	
Source of Data 2	
Source of Data 3	
ICD and/or Manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

ANNEX 5: DIRECTORY OF INDICATORS FOR CARDIOVASCULAR TRACER CONDITIONS

Indicator number	**CVD1**
Indicator	**% of men/women (18+) who have an annual well visit with their GP**
Tracer	Hypertension
Pathway time	Not conditional on any event
Block	Promotion and Prevention
Hypothesis	Lack of preventive care and screening for risks
Sub-hypothesis	
Numerator	Men/women (18+) who have a well visit in year t
Denominator	Men/women (18+) alive in year t
Source of Data 1	NHS Payment Data
Source of Data 2	NHS Patient Registry
Source of Data 3	NHS Patient Registry
ICD and/or manipulation codes	Manipulation Code for annual well visit?
Outstanding clarification questions	
Assumptions	We would not be capturing annual well visits performed in the private sector, such as private OB/Gyn.
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**CVD2**
Indicator	**Patients diagnosed with at least four hypertensive medication refills per year**
Tracer	Hypertension
Pathway time	Conditional on Diagnosis
Block	Timeliness
Hypothesis	Lack of management of underlying conditions (hypertension and diabetes) lead to too many acute cases
Sub-hypothesis	Delay between diagnosis and prescription use Patients do not consistently take medications
Numerator	Patients with at least four hypertensive medication refills within the first year following the first visit in year t where they were diagnosed with hypertension
Denominator	Patients with a diagnostic code of hypertension in year t
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	Physicians cannot prescribe more than 3 months of medication at a time. OR Pharmacists cannot fill more than 3 months of supply at a time.
Additional tests	
Notes 1	If patient is taking more than one medication: analyze the two medications separately and use the higher value Need to exclude pregnancy-induced hypertension (separate ICD 10 code)
Notes 2	
References	

Indicator number	**CVD3**
Indicator	**% avoidable hospital admissions for hypertension and diabetes**
Tracer	Hypertension/ Diabetes
Pathway time	Conditional on Diagnosis
Block	Coordination and level
Hypothesis	Lack of management of underlying conditions (hypertension and diabetes) lead to too many acute cases
Sub-hypothesis	Excessive avoidable hospitals admissions
Numerator	Avoidable admissions for Hypertension/ Diabetes as defined by OECD protocol
Denominator	Total admissions for Hypertension/ Diabetes diagnosed
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	Calculate indicator separately for hypertension and diabetes
Notes 1	Avoidable hospital admissions were previously calculated by the Center for Health Economics. (Asthma, COPD, CHF, Diabetes) Use OECD protocol for calculation of this indicator
Notes 2	
References	

Indicator number	CVD4
Indicator	**% avoidable specialist visit for hypertension and diabetes**
Tracer	Hypertension/ Diabetes
Pathway time	Conditional on Diagnosis
Block	Coordination and level
Hypothesis	Lack of management of underlying conditions (hypertension and diabetes) lead to too many acute cases
Sub-hypothesis	There is excessive avoidable specialist care being provided for hypertension and diabetes in Latvia.
Numerator	Specialist visits for uncomplicated hypertension/ diabetes
Denominator	Total specialist visits for Hypertension/ Diabetes diagnosed
Source of Data 1	NHS payment data
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	"Complicated/Uncomplicated" as defined by the team using international and regional guidelines, since Latvia does not have a national guideline. "Complicated" cases were defined more broadly to widen the spectrum of allowable specialist visits.
Additional tests	Calculate indicator separately for hypertension and diabetes
Notes 1	Adapting the protocol from Estonia accounting for Latvian medical guidelines and specialist types
Notes 2	
References	

Indicator number	**CVD5**
Indicator	**Cholesterol (total & fraction) test performed annually for Hypertension/ Diabetes patients**
Tracer	Hypertension/ Diabetes
Pathway time	Conditional on Diagnosis
Block	Good technical practice
Hypothesis	Lack of management of underlying conditions (hypertension and diabetes) lead to too many acute cases
Sub-hypothesis	
Numerator	Patients with a diagnosis of hypertension / diabetes in year t or t-1 who had a Cholesterol Test performed in year t
Denominator	Total patients with a diagnosis of Hypertension/ Diabetes in year t or t-1
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	Manipulation codes 41047/41054/41056/ 41057/41058/41059/ 41060
Assumptions	
Additional tests	Calculate indicator separately for hypertension and diabetes
Notes 1	
Notes 2	
References	

Indicator number	CVD6
Indicator	**Percentage of Hypertension/ Diabetes patients with annual serum renal function and albuminuria tests performed**
Tracer	Hypertension/ Diabetes
Pathway time	Conditional on Diagnosis
Block	Good technical practice
Hypothesis	Lack of management of underlying conditions (hypertension and diabetes) lead to too many acute cases
Sub-hypothesis	
Numerator	Patients with a diagnosis of hypertension / diabetes in year t or t-1 who had a serum renal function and albuminuria test performed in year t
Denominator	Total patients with a diagnosis of Hypertension/ Diabetes in year t or t-1
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	Manipulation Codes
Assumptions	
Additional tests	Calculate indicator separately for hypertension and diabetes
Notes 1	
Notes 2	
References	

Indicator number	**CVD7**
Indicator	**Percentage of Diabetes patients with an annual HgA1c tests performed**
Tracer	Diabetes
Pathway time	Conditional on Diagnosis
Block	Good technical practice
Hypothesis	Lack of management of underlying conditions (hypertension and diabetes) lead to too many acute cases
Sub-hypothesis	
Numerator	Patients with a diagnosis of diabetes in year t or t-1 who had a HgA1c test performed in year t
Denominator	Total patients with a diagnosis of Diabetes in year t or t-1
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	Manipulation Codes
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**CVD8**
Indicator	**Percentage of diabetes patients with end-stage renal failure**
Tracer	Hypertension/ Diabetes
Pathway time	Conditional on Diagnosis
Block	Morbidity
Hypothesis	Lack of management of underlying conditions (diabetes) leads to too many acute cases
Sub-hypothesis	
Numerator	Number of patients with a diagnosis of diabetes in year t or t-1, who have end-stage renal failure
Denominator	Total patients with a diagnosis of Diabetes in year t or t-1
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	
ICD and/or manipulation codes	
Outstanding clarification questions	Dialysis patients to be identified from diagnosis codes only or procedure codes
Assumptions	End-stage renal failure would be defined by either the ICD code N18.5 or Z49 (care involving dialysis)
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**CVD9**
Indicator	**Aspirin and statin use among at-risk populations (check guidelines)**
Tracer	CAD/ AMI/ CHF
Pathway time	Conditional on diagnosis
Block	Good technical practice and timeliness
Hypothesis	Lack of management of underlying conditions (CAD) leads to too many acute cases
Sub-hypothesis	
Numerator	Patients who have at least four refills of aspirin/statin medication within 1 year of first visit with diagnosis code of AMI, CAD or CHF in year t
Denominator	Patients with a diagnosis of AMI, CAD or CHF in year t
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	Is aspirin a prescription medication?
Assumptions	
Additional tests	Calculate indicator separately for aspirin and statin
Notes 1	
Notes 2	
References	

Indicator number	**CVD10**
Indicator	**% of patients with AMI, CAD or CHF diagnosis with visit to cardiologist within 1 year**
Tracer	CAD/ AMI/ CHF
Pathway time	Conditional on Diagnosis
Block	Timeliness
Hypothesis	Lack of management of underlying conditions (AMI, CAD, CHF) leads to too many acute cases
Sub-hypothesis	
Numerator	Patients who have at least one visit to a cardiologist within 1 year of first visit with diagnosis code of AMI, CAD or CHF in year t
Denominator	Patients with a diagnosis of AMI, CAD or CHF in year t
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	We need to be able to capture accurately the patients who visit cardiologists with private financing.
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	**CVD11**
Indicator	**Follow-up (primary or cardiologist) visit within 30/60/90 days of inpatient/acute discharge for AMI, CAD or CHF**
Tracer	CAD/ AMI/ CHF
Pathway time	Conditional on Discharge & Diagnosis
Block	Timeliness
Hypothesis	□ Inadequate follow-up after acute episodes leads to high rates of readmissions.
Sub-hypothesis	
Numerator	Patients with a visit to GP or cardiologist within 30/60/90 days after discharge from inpatient stay with a diagnosis of AMI, CAD or CHF at discharge.
Denominator	Number of patients discharged from inpatient stay with a diagnosis of AMI, CAD or CHF at discharge
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	We need to be able to capture accurately the patients who visit cardiologists with private financing.
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	CVD12
Indicator	**Avoidable hospital admission for CHF (use OECD protocol)**
Tracer	CHF
Pathway time	Conditional on Diagnosis
Block	Coordination and level
Hypothesis	Excessive avoidable hospitals admissions
Sub-hypothesis	
Numerator	Avoidable admissions for Hypertension/ Diabetes
Denominator	Total admissions for Hypertension/ Diabetes diagnosed
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	See OECD protocol
Notes 2	Cross check results against previous calculations from Center for Health Economics, to ensure consistency.
References	

Indicator number	CVD13
Indicator	**30 day readmission rate after inpatient stay related to AMI, CAD or CHF**
Tracer	CAD/ AMI/ CHF
Pathway time	Conditional on Diagnosis
Block	Quality
Hypothesis	Inadequate follow-up after acute episodes leads to high rates of readmissions.
Sub-hypothesis	
Numerator	Patients with hospital admission within 30 days of discharge of an inpatient stay with a diagnosis of AMI, CAD or CHF at discharge
Denominator	Number of patients discharged from inpatient stay with a diagnosis of AMI, CAD or CHF at discharge
Source of Data 1	
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	
Outstanding clarification questions	Should an admission to a care hospital count if within 30 days from discharge from an acute hospital, but not immediately following?
Assumptions	
Additional tests	
Notes 1	Unplanned hospital readmissions may or may not be related to the previous visit, and some unplanned readmissions aren't preventable. The standard benchmark used by Centers for Medicare and Medicaid Services (CMS) is the 30 day readmission rate. Patients t
Notes 2	
References	Mayoclinic.org

Indicator number	CVD14
Indicator	**Statin, Aspirin, ACE inhibitor, beta blocker prescription dispensed after discharge for AMI**
Tracer	AMI
Pathway time	Conditional on Diagnosis
Block	Quality
Hypothesis	Inadequate follow-up after acute episodes leads to high rates of readmissions.
Sub-hypothesis	
Numerator	Number of patients discharged from inpatient stay with a diagnosis of AMI who buy Statin/Aspirin/ACE inhibitor/beta blocker prescription within 30/60/90 days after discharge
Denominator	Number of patients discharged from inpatient stay with a diagnosis of AMI
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	? Any information on never picked up prescriptions from e-health system or similar?
Assumptions	Hospitals do not discharge patients with an initial supply of drugs for home use.
Additional tests	
Notes 1	If aspirin is routelinely not prescribed because it's over the counter, we should remove it from the indicator.
Notes 2	From the date of the prescription, check whether the prescription was written before the discharge.
References	

Indicator number	CVD15
Indicator	**Mortality rate within 30 days after hospital admission for AMI**
Tracer	CAD/ AMI/ CHF
Pathway time	Conditional on Diagnosis
Block	Mortality
Hypothesis	Poor quality of care after AMI leads to high rates of mortality.
Sub-hypothesis	
Numerator	Number of patients who died within 30 days of admission to hospital with a diagnosis of AMI
Denominator	Number of patients admitted to hospital with a diagnosis of AMI
Source of Data 1	NHS payment data
Source of Data 2	Death Registry
Source of Data 3	Death Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	Need to identify benchmark countries
Notes 2	
References	

Indicator number	**CVD16**
Indicator	**Stroke patients receive CT scan on day of hospital admission.**
Tracer	Stroke
Pathway time	Conditional on Diagnosis
Block	Timeliness
Hypothesis	Poor quality of care after stroke leads to high rates of morbidity/mortality.
Sub-hypothesis	
Numerator	Number of patients admitted to hospital with a diagnosis of stroke, who had a CT scan on the day of admission.
Denominator	Number of patients admitted to hospital with a diagnosis of stroke
Source of Data 1	NHS payment data
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	Manipulation Codes
Outstanding clarification questions	
Assumptions	Date entered for CT scan manipulation is accurate - so it reflects the time of the procedure, and not the time of recording of the procedure.
Additional tests	Completeness of the time information for the manipulation code, and what this time represents.
Notes 1	Do the data have information on the time of admission - double check the database.
Notes 2	
References	

Indicator number	**CVD17**
Indicator	**Follow-up (primary or neurologist) visit within 30/60/90 days of inpatient/acute discharge for stroke**
Tracer	Stroke
Pathway time	Conditional on Diagnosis
Block	Timeliness
Hypothesis	Inadequate follow-up after acute episodes leads to high rates of readmissions. // Poor quality of care after stroke leads to high rates of morbidity/mortality.
Sub-hypothesis	
Numerator	Patients with a visit to GP or neurologist within 30/60/90 days after discharge from inpatient stay with a diagnosis of stroke at discharge.
Denominator	Number of patients discharged from inpatient stay with a diagnosis of stroke at discharge
Source of Data 1	NHS payment data
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	CVD18
Indicator	**Time elapsed between emergency call and transport to hospital**
Tracer	Stroke
Pathway time	Conditional on Diagnosis
Block	Timeliness
Hypothesis	Delay between emergency call and transport (arrival) to hospital
Sub-hypothesis	
Numerator	
Denominator	
Source of Data 1	SEMS data
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	use SEMS published information - will not compute this indicator from scratch
Notes 2	Check whether SEMS disaggregates the indicator between rural and urban areas.
References	

Indicator number	**CVD19**
Indicator	**Mortality rate within 30 days after hospital admission for stroke**
Tracer	Stroke
Pathway time	Conditional on Diagnosis
Block	Mortality
Hypothesis	Poor quality of care after stroke leads to high rates of mortality.
Sub-hypothesis	
Numerator	Number of patients who died within 30 days of admission to hospital with a diagnosis of stroke
Denominator	Number of patients admitted to hospital with a diagnosis of stroke
Source of Data 1	NHS payment data
Source of Data 2	Death Registry
Source of Data 3	Death Registry
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	Need to identify benchmark countries
Notes 2	
References	

Indicator number	CVD20
Indicator	**Patients with thrombolytic after hospitalization**
Tracer	Stroke
Pathway time	Conditional on Hospital Stay
Block	Quality
Hypothesis	
Sub-hypothesis	
Numerator	Number of patients who were given thrombolytic, among patients admitted to hospital with a diagnosis of stroke
Denominator	Number of patients admitted to hospital with a diagnosis of stroke
Source of Data 1	NHS payment data
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	CVD21
Indicator	**Discharge to usual place of residence within 56 days of hospital admission (age 50+)**
Tracer	Stroke
Pathway time	Conditional on Hospital Stay
Block	Quality
Hypothesis	
Sub-hypothesis	
Numerator	Number of patients age 50+ discharged to usual place of residence within 56 days of admission to hospital with a diagnosis of stroke.
Denominator	Number of patients age 50+ admitted to hospital with a diagnosis of stroke
Source of Data 1	NHS payment data
Source of Data 2	
Source of Data 3	
ICD and/or manipulation codes	manipulation code for discharge to home
Outstanding clarification questions	
Assumptions	
Additional tests	
Notes 1	
Notes 2	
References	

Indicator number	CVD22
Indicator	**Statin, Aspirin, prescription dispensed after discharge for stroke**
Tracer	Stroke
Pathway time	Conditional on Diagnosis
Block	Quality
Hypothesis	Inadequate follow-up after acute episodes leads to high rates of readmissions.
Sub-hypothesis	
Numerator	Number of patients discharged from inpatient stay with a diagnosis of stroke who buy Statin/Aspirin prescription within 30/60/90 days after discharge
Denominator	Number of patients discharged from inpatient stay with a diagnosis of stroke at discharge
Source of Data 1	NHS payment data
Source of Data 2	Disease Registry
Source of Data 3	Disease Registry
ICD and/or manipulation codes	
Outstanding clarification questions	? Any information on never picked up prescriptions from e-health system or similar?
Assumptions	Hospitals do not discharge patients with an initial supply of drugs for home use.
Additional tests	
Notes 1	If aspirin is routelinely not prescribed because it's over the counter, we should remove it from the indicator.
Notes 2	From the date of the prescription, check whether the prescription was written before the discharge.
References	

ANNEX 6 MATERNAL AND PERINATAL INDICATOR DIRECTORY

Indicator number	**MP1**
Indicator	**Average number of prenatal care visits**
Tracer	High-risk pregnancy
Pathway time	Promotion and Prevention
Block	Timely utilization
Hypothesis	High-risk pregnancies are not adequately identified.
Sub-hypothesis	
Numerator	Number of prenatal care visits for pregnancies ending in a live birth
Denominator	Number of pregnancies ending in a live birth
Source of Data 1	NHS payment data
Source of Data 2	Birth registry: "completeness of the prenatal care"
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	Confirm WHO protocol: denominator is pregnancies ending in live birth, irrespective of the number of gestational weeks
Assumptions	
Test this	Reliability of completeness of the prenatal care
Notes 1	For birth registry: check how/when the information is filled in, and what sources of informaiton are used (patient chart? Pregnancy passport?)
Notes 2	
References	

Indicator number	MP2
Indicator	**% of pregnant women who receive first prenatal care visit in first trimester (WHO)**
Tracer	High-risk pregnancy
Pathway time	Promotion and Prevention
Block	Timely utilization
Hypothesis	High-risk pregnancies are not adequately identified.
Sub-hypothesis	
Numerator	Number of pregnancies ending in a live birth that had a prenatal care visit in week 12 or before.
Denominator	Number of pregnancies ending in a live birth
Source of Data 1	Birth registry
Source of Data 2	NHS payment data
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	Confirm WHO protocol: denominarot is pregnancies ending in live birth, irrespective of the number of gestational weeks
Assumptions	in birth registry: no answer is "no"
Test this	Difference in birth registry data and NHS payment data should enable to estimate privately financed prenatal care.
Notes 1	For birth registry: check how/when the information is filled in, and what sources of informaiton are used (patient chart? Pregnancy passport?)
Notes 2	Check Latvia standard from counting weeks of gestation: from LMD or 2 weeks after LMD
References	

Indicator number	**MP3**
Indicator	**% of pregnant women receiving an ultrasound in first trimester**
Tracer	High-risk pregnancy
Pathway time	Promotion and Prevention
Block	Timely utilization
Hypothesis	High-risk pregnancies are not adequately identified.
Sub-hypothesis	
Numerator	Number of pregnancies ending in a live birth, that had an ultrasound in week 12 or earlier
Denominator	Number of pregnancies ending in a live birth
Source of Data 1	Birth registry
Source of Data 2	NHS payment data
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	Confirm WHO protocol: denominarot is pregnancies ending in live birth, irrespective of the number of gestational weeks
Assumptions	
Test this	Difference in birth registry data and NHS payment data should enable to estimate privately financed prenatal care.
Notes 1	For birth registry: check how/when the information is filled in, and what sources of informaiton are used used (patient chart? Pregnancy passport?)
Notes 2	Check Latvia standard from counting weeks of gestation: from LMD or 2 weeks after LMD
References	

Indicator number	**MP4**
Indicator	**% of women screening for gonorrhea, chlamydia and HIV during prenatal care**
Tracer	High-risk pregnancy
Pathway time	Promotion and Prevention
Block	Good technical practice
Hypothesis	Quality of care in prenatal and perinatal period is not optimal.
Sub-hypothesis	High-risk pregnancies are not adequately identified.
Numerator	Number of pregnancies ending in a live birth for whom there was screening for gonorrhea, chlamydia and HIV during prenatal care
Denominator	Number of pregnancies ending in a live birth
Source of Data 1	Birth registry: HIV screening
Source of Data 2	
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	
Notes 2	
References	

Indicator number	MP5
Indicator	**Cases of eclampsia during pregnancy**
Tracer	High-risk pregnancy
Pathway time	Conditional on diagnosis
Block	Morbidity
Hypothesis	Quality of care in prenatal and perinatal period is not optimal.
Sub-hypothesis	High-risk pregnancies are not adequately identified.
Numerator	Number of cases of maternal eclampsia
Denominator	Number of pregnancies ending in a live or still birth
Source of Data 1	NHS payment data
Source of Data 2	any additional source of data?
Source of Data 3	
Manipulation codes	ICD-10 codes for pre-eclampsia and O14 plus subcodes. ICD-10 for eclampsia are O15 and subcodes.
Outstanding clarification questions	
Assumptions	Number should be as close to zero as possible
Test this	Test against benchmark countries
Notes 1	Benchmark countries: 5/10,000 maternities (Scandinavia), 6.2/10,000 deliveries (Netherlands),
Notes 2	
References	

Indicator number	**MP6**
Indicator	**Obstetric readmissions**
Tracer	High-risk pregnancy
Pathway time	Conditional on diagnosis
Block	Morbidity
Hypothesis	Quality of care in prenatal and perinatal period is not optimal.
Sub-hypothesis	
Numerator	Number of hospital readmissions with a maternal complication ICD 10 code, within 30 days of delivery (discharge after delivery?)
Denominator	Number of pregnancies ending in a live birth or stillbirth
Source of Data 1	
Source of Data 2	
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	
Notes 2	
References	

Indicator number	MP7
Indicator	**Deliveries up to 36 (34?) weeks or less that take place at at hospitals with insufficient NICU resolutive capacity**
Tracer	High-risk pregnancy
Pathway time	Conditional on diagnosis
Block	Care setting
Hypothesis	High-risk pregnancies are not referred to higher level hospital.
Sub-hypothesis	
Numerator	Number of pregnancies with 36 weeks of gestation or less, that take place at hospitals with insufficient NICU capacity
Denominator	Number of pregnancies with 36 weeks of gestation or less
Source of Data 1	Birth registry
Source of Data 2	NHS payment data
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	Check Latvia standard from counting weeks of gestation: from LMD or 2 weeks after LMD -- adjust numbers of gestation to make sure it reflects premature birth
Assumptions	
Test this	
Notes 1	This indicator needs to be further discussed - it needs to be aligned with the hospital study.
Notes 2	Premature deliveries at non-equipped hospitals can be the result of (i) inappropriate identification or referral of high-risk patients or (ii) lack of accessibility of equipped hospitals. Both are relevant for policy recommendations.
References	

Indicator number	MP8
Indicator	**Percentage of deliveries with birth complications in tertiary, regional and local hospitals (or: in hospitals with high, medium and low NICU resolutive capacity)**
Tracer	High-risk pregnancy
Pathway time	Conditional on diagnosis
Block	Care setting
Hypothesis	High-risk pregnancies are not referred to higher level hospital.
Sub-hypothesis	
Numerator	Number of births in hospitals with low/medium/high resolutive capacity that have birth complications
Denominator	Number of births in hospitals with low/medium/high NICU resolutive capacity
Source of Data 1	
Source of Data 2	
Source of Data 3	
Manipulation codes	ICD-10 codes associated with birth complications are O60-O75 but these include a wide variety of issues and concepts. Need to further narrow down.
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	This indicator needs to be further discussed - it needs to be aligned with the hospital study.
Notes 2	Compute separately for tertiary, regional and local hospitals, or define alternative categories based on NICU resolutive capacity. Birth complications defined as births that have either or both of the following (i) diagnostic codes indicating birth complications (ii) manipulation codes that indicate manipulations associated with birth complications, such as >>>>
References	

ANNEX 7: MENTAL HEALTH INDICATOR DIRECTORY

Indicator number	**M1**
Indicator	**Percentage of annual visits that include screening for depression**
Tracer	Depression
Pathway time	Prevention and screening
Block	Good technical quality
Hypothesis	Depression is under-diagnosed
Sub-hypothesis	
Numerator	Number of annual well visits for ages 15 and over that include depression screening
Denominator	Number of annual well visits for ages 15 and over
Source of Data 1	NHS payment data do not contain manipulation code for depression screening ? Use secondary sources of data
Source of Data 2	
Source of Data 3	
Manipulation codes	Depression F32 and F 33 (ICD10)
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	It is unlikely we would be able to calculate this indicator from primary data sources
Notes 2	
References	

Indicator number	M2
Indicator	**Percentage of patients with a depression diagnosis that receive treatment either through medication or psycho-therapy**
Tracer	Depression
Pathway time	Treatment
Block	Good technical quality
Hypothesis	Depression is under-treated
Sub-hypothesis	
Numerator	Patients with at least four antidepressive medication refills or four psychotherapy or behavioral therapy visits within the first year following the first visit in year t where they were diagnosed with depression
Denominator	Number of patients with a diagnosis of depression in any visit in year t
Source of Data 1	
Source of Data 2	
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	
Notes 2	
References	

Indicator number	**M3**
Indicator	**Percentage of patients with an active CVD or cancer diagnosis that have a diagnosis of depression**
Tracer	Depression combined with CVD and cancer
Pathway time	Diagnosis
Block	Good technical quality
Hypothesis	Depression is under-diagnosed
Sub-hypothesis	
Numerator	Number of patients with a diagnosis of CVD or cancer in any visit in year t, who have a diagnosis of depression in year t or year t+1
Denominator	Number of patients with a diagnosis of CVD or cancer in any visit in year t
Source of Data 1	
Source of Data 2	
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	Methodology is benchmarking against other countries.
Notes 2	
References	

Indicator number	**M4**
Indicator	**Percentage of postpartum patients diagnosed with depression**
Tracer	Postpartum depression
Pathway time	Diagnosis
Block	Good technical quality
Hypothesis	Depression is under-diagnosed
Sub-hypothesis	
Numerator	Number of patients with a diagnosis of depression within 6 months after delivery
Denominator	Number of women who deliver in year t
Source of Data 1	NHS payment data
Source of Data 2	Mental health registry
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	Methodology is benchmarking against other countries.
Notes 2	
References	

Indicator number	**M5**
Indicator	**Percentage of patients with an active CVD or cancer diagnosis that receive treatment for depression, either through medications or through psycho-behavioral therapy**
Tracer	Depression combined with CVD and cancer
Pathway time	Treatment
Block	Good technical quality
Hypothesis	Depression is under-diagnosed and under-treated
Sub-hypothesis	
Numerator	Patients with at least four antidepressive medication refills or four psychotherapy or behavioral therapy visits within the first year following the first visit in year t where they were diagnosed with CVD or cancer
Denominator	Number of patients with a diagnosis of CVD or cancer in any visit in year t
Source of Data 1	NHS payment data
Source of Data 2	cancer registry, mental health registry
Source of Data 3	
Manipulation codes	
Outstanding clarification questions	
Assumptions	
Test this	
Notes 1	
Notes 2	
References	