Health Care Integration Indicators

Background Paper to
The State of Health Care Integration in Estonia

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WORLD BANK GROUP

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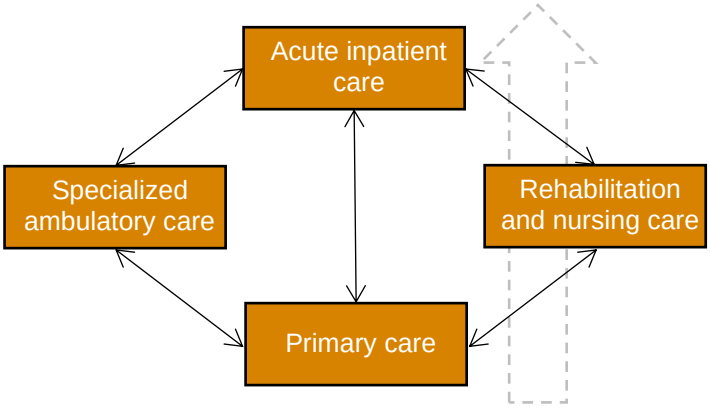
Introduction

In 2014 the World Bank Group (WBG) partnered with the Estonian Health Insurance Fund (EHIF) to assess the state of health care integration and its driving forces (World Bank 2015). Stakeholders deemed this assessment important to help prepare the Estonian health system to meet the challenges of the future, including the changing demand for services due to the rise of non-communicable diseases.

The study defined health care integration as: i) the delivery of care in the appropriate care setting and ii) coordination and continuity of care across care settings. Four care settings are identified: primary care, specialized ambulatory care, acute inpatient care, and rehabilitation and nursing care (Figure 1).

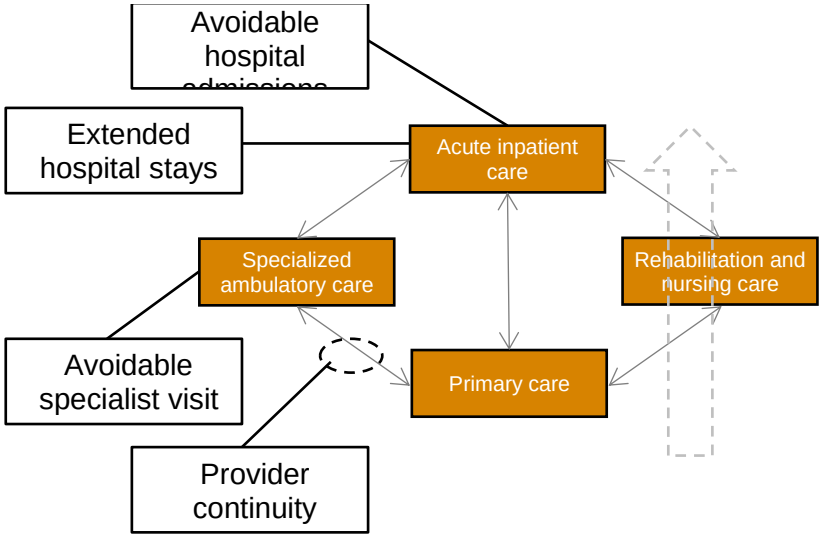
Figure 1. Health care settings



The study used both quantitative and qualitative methods. The quantitative component gauged system performance issues resulting from weak integration of care. The study hypothesized, for example, that weak integration could result in problems such as avoidable hospital admissions, extended hospital stays, avoidable specialist visits, and provider continuity problems (Figure 2).

As a preliminary step in the investigation, the study team inventoried all the possible performance issues or problems related to health care integration, across all the care settings. These were categorized into i) performance issues related to health system outcomes; ii) first order problems related to care delivery and coordination; and iii) second order problems related to the broader health system, such as governance, financing, mechanisms and processes, and inputs.

Figure 2. Examples of weak integration problems



The study team conducted a literature review to look globally at established indicators and survey instruments used to measure health care integration. The team identified indicators that are well-established in national performance frameworks and the literature. From this inventory, the study team and stakeholders agreed on eight quantitative indicators used in the final study, which also included indicators that were newly developed to account for Estonia-specific system features and issues (see Annex). The final scope of the study focused on integration issues related to the prevention and treatment of chronic diseases, with particular attention to the role and functioning of primary care and equity issues.

Background Paper Contents and Structure

This background paper details the results of the preliminary literature review, conducted in 2014. This paper shares the full inventory of possible health care integration indicators across care settings, organized by the three categories of problems mentioned above. To compile this inventory, the study team reviewed the national health system performance frameworks of several OECD countries, as well the literature on health system performance measurement, health care quality, and care coordination and management.

This paper is structured as follows: Section 1 lists the inventory of problems by category, and Section 2 provides corresponding indicator measures and sources, as well as relevant survey instruments and questions. Section 2 also includes references to sources that provide frameworks, benchmarks, or standards for assessing many of the first order problems.

Section 1. List of Potential Problems Related to Health Care Integration

Health Outcome Problems Related to Health Care Integration

1.1 Avoidable mortality
1.2 Avoidable medical conditions
1.3 Patient satisfaction

Health Care Integration Problems Related to Care Delivery and Coordination

System Wide Problems

2.1 Bias toward acute treatment vs. preventive care and health promotion

2.2 Bias toward acute treatment vs. social care

Problems within Primary Care

2.3 Provision of services beyond what is specified by clinical guidelines (overuse) or failure to provide medically necessary services (underuse)

2.4 Lack of continuity of care

Problems with Specialized Ambulatory Care

Not researched.

Problems within Acute Inpatient Care

2.5 Provision of services beyond what is specified by clinical guidelines (overuse) or failure to provide medically necessary services (underuse)

2.6 Lack of horizontal integration

- Provision of services within most appropriate type of provider
- Sufficient volume of services by provider

Problems at the Interface between Primary and Specialized Ambulator Care

2.7 Inadequate follow-up for specialized ambulatory care as specified by disease specific clinical pathways

Problems at the Interface between Specialized Ambulatory and Acute Inpatient Care

2.8 Avoidable hospital admissions (e.g., emergency admissions)

- Vaccine preventable diseases
- Acute conditions (infections, gastroenteritis)
- Chronic conditions (diabetes, asthma, angina, hypertension, congestive heart failure, chronic obstructive pulmonary disease)

2.9 (Avoidable) Readmission rates

2.10 Early and incomplete hospital discharges

2.11 Inadequate follow-up for acute inpatient care as specified by disease specific clinical pathways

Problems at the Interface between Acute Inpatient and Nursing Care

2.12 Length of stay in hospital that exceeds what is medically necessary

- Within 56 days of emergency admission from there with a stroke (ages 50 and over)
- Within 28 days of emergency admission from with a fractured femur neck (ages 65 and over

Problems within Patient Population

2.13 Inadequate management/coordination of care by patient or family members (e.g., failure to keep appointments, failure to follow treatment regimen)

Health Care Integration Problems Related to the Broader Health System

Problems with System Governance

3.1 Vertical fragmentation of responsibility for providing care between different levels of government

3.2 Organization of care within geopolitical areas

3.3 Physical separation of primary care and specialist services (no co-location of services)

Problems with Contracting and Financing

3.4 Lack of effective contractual arrangements between payers and providers to coordinate care

3.5 Lack of effective contractual arrangements between different health care providers to coordinate care

3.6 Lack of sufficient funding for chronic conditions care (drugs, staff costs, infrastructure, equipment, etc.)

3.7 Negative effect of provider payment mechanisms on coordination of care

- Fee for service
- Capitation
- Case-based payment
- Salary
- Episode-based payment
- Other

3.8 Lack of financial rewards for treating and improving care coordination for chronic conditions

3.9 Fragmentation of funding for chronic care management

3.10 Lack of accountability of primary care providers for

- Quality of care
- Efficiency of care

Problems with Mechanisms and Processes

3.11 Lack of multi/ interdisciplinary teamwork among providers to coordinate care

3.12 Inappropriate point of entry into the healthcare system

- Specialist ambulatory care
- Emergency outpatient
- Acute inpatient care

3.13 Lack of a designated responsibility for guiding patients through the healthcare system and coordinating care

- Non-physician health care professionals or (e.g., nurse, medical assistant, case manager)
- Non-health care professionals (e.g., social worker)
- Primary care physicians
- Ambulatory care physicians
- Health care insurers (e.g., health maintenance organization [HMO])

3.14 Lack of participation of primary care physicians in disease management program

3.15 Failure to take patient preferences and needs into account when choosing referral destination

3.16 Inadequate system of procurement and distribution of drugs for chronic conditions

3.17 Failure to maintain comprehensive and up-to-date patient medical records

3.18 Failure to use medical records to routinely monitor and coordinate patient care

3.19 Failure to efficiently share clinical records and/or information on patient needs between providers (both within and between different health care levels)

Problems with Health Care Inputs

Physical resources

3.20 Lack of nursing care facilities (long term care and home care)

3.21 Shortage of ambulatory care providers (specialized and primary care)

3.22 Lack of comprehensive of primary care services (including medical specialties, prevention, health education and follow-up service)

3.23 Inadequate supply of medical equipment in primary care settings

3.24 Inadequate working conditions and supply of medical equipment for management of chronic conditions

3.25 Shortage of drugs necessary for the management of chronic conditions

Human resources

3.26 Shortage of primary health care professionals (physicians, nurses, physiotherapists)

3.27 Lack of skills among primary health care professionals in the management of chronic conditions

3.28 Lack of awareness among general population regarding chronic conditions management

3.29 Lack of awareness among chronic condition sufferers and their families regarding chronic conditions management

Technology

3.30 Lack of information on chronic condition management

3.31 Lack of formal guidelines or protocols for the prevention and management of chronic diseases

3.32 Lack of formal pathways for management of patients with chronic conditions/diseases

3.33 Lack of electronic medical records with a uniform platform for care coordination

Social resources

3.34 Lack of special rights and entitlements (benefits, pensions, exemptions, housing, etc.) for individuals with chronic diseases (including disability and other conditions)

3.35 Lack of social and advocacy groups for individuals with chronic diseases

Section 2. Health Care Integration Indicators

Health Outcome Problems Related to Health Care Integration

1.1 Avoidable mortality

Measures	Source
Mortality	Gravelle and others 2007
Avoidable mortality from preventable causes	Canadian Health Services Research Foundation and Canadian Institute for Health Information 2002
Avoidable mortality from treatable causes	
Potentially avoidable mortality	
Cardiovascular mortality in patients with diabetes	Greenfield and others 2004

1.2 Avoidable medical conditions

Measures	Source
Lower extremity amputation rates	Greenfield and others 2004
Kidney disease in persons with diabetes	

1.3 Patient Satisfaction

Survey: LSHTM, Respondent: Patient (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	PA V	Is there a HT association of patients? Are you involved? How?

Health Care Integration Problems Related to Care Delivery and Coordination

System Wide Problems

2.1 Bias toward acute treatment vs. preventive care and health promotion

For further information on this problem see: Tucker and others 2008, and Legido-Quigly and others 2013.

Measures	Source
Spending on acute treatment as a share of total health expenditure	Tucker and others 2008 Legido-Quigly and others 2013
Spending on preventive care as a share of total health expenditure	
Spending on health promotion as a share of total health expenditure	

2.2 Bias toward acute treatment vs. social care

For further information on this problem see: Tucker and others 2008, and Legido-Quigly and others 2013.

Measures	Source
Spending on acute treatment as a share of total health expenditure	Tucker and others 2008 Legido-Quigly and others 2013
Spending on social care as a share of total health expenditure	

Problems within Primary Care

2.3 Provision of services beyond what is specified by clinical guidelines (overuse*) or failure to provide medically necessary services (underuse)

*Overuse includes test/procedure duplication, provision of services that offer no direct benefit to the patient or provision of services that cause harm (misuse/medical errors).

For further information on this problem see: Blendon and others 2003, Tucker and others 2008, and Legido-Quigly and others 2013.

Measures	Source
Input Measures	Greenfield and others 2004 Estonia Health Insurance Fund 2010
Diabetes: Annual HbA1c testing Annual LDL cholesterol testing Annual screening for nephropathy (creatin, albumin) Annual eye exam	

Measures	Source
Annual total cholesterol testing Annual fractions of cholesterol testing every 3 years	Estonia Health Insurance Fund 2010
Process Measures	Estonia Health Insurance Fund 2010
Diabetes: Annual nurse counselling	
Outcome Measures	Greenfield and others 2004
Diabetes: HbA1c control LDL cholesterol control	

2.4 Lack of continuity of care

Measures	Source
Chronology of Care	
Intensity of patient/provider affiliation	
Number (and or duration) of visits with a provider over a defined interval [encounter or registration data]—may apply threshold intensity, be adapted to examine discontinuity, or, in mental health, to define active cases	CHSRF 2002
Concentration of care	
Number of providers: Number of providers with whom the patient had contact during an episode of care or time interval [encounter or registration data]—assumes that greater concentration implies stronger relationships, more consistent care plans, and or smoother transfers of information	CHSRF 2002
Continuity of Care Index: Measures both concentration and dispersion at the population level [encounter or registration data]—comparable across studies	
Modified Continuity Index: Measures the concentration of care in a population of patients calculated by dividing the average number of visits by a group by the average number of providers in a population—developed to account for problems of COC index; rarely used	

Measures	Source
Modified Continuity Index: Measure concentration of care in a population of patients—developed to account for problems of COC and MCI; rarely used	
Likelihood of Continuity: The probability that the number of providers seen is fewer than that would have occurred under random conditions, given the patient's utilization levels and the number of available providers— most applicable in setting where there are significant differences in provider supply; helps differentiate between forced and chosen continuity	CHSRF 2002
Usual provider / known provider continuity	
Affiliation between patient and provider: Asks whether or not patient has a regular provider. Patient lists may be used to infer the presence of a regular provider	CHSRF 2002
The number of visits to a 'usual' provider in a given period over the total number of visits to similar providers—can be modified to measure continuity of providers practicing as a group (site continuity) and aggregated to population level	
Mean length of time a patient is with a primary care physician	Schmittdiel and others 2006
Primary care physician turnover rate over 5 years [%]	
Concentration of care with different providers: K – (N-k) / (N-1) where N is total number of visits and k the number of providers seen in a defined interval—allows for comparison across sites and studies; sensitive to differences in utilization levels	CHSRF 2002
Sequencing of care	
Sequential Continuity: Proportion of sequential visits over a discrete time interval that were with the same provider [encounter or registration data]—potentially useful as a measure of necessary inter-provider communication needs	
Alpha Index: A weighted average between sequential continuity and concentration of care	

Measures	Source
Survey-based Sequential Continuity: Asks patients whether provider seen at current visit was the same at the prior visit or whether provider seen was patient's usual provider [survey data]	
Relational Continuity	
Strength of relationship	
Survey questions on the extent of affiliation. May ask patient whether they know provider well, adequacy of communication, trust, sense of ongoing responsibility to patient [survey data]	CHSRF 2002
Perception of Continuity Scale: Self-administered questionnaire with 23 items divided into sub-scales of structural and interpersonal elements [survey data]—good internal consistency and reliability. Interpersonal scale has significant face validity	
Multi-dimensional primary care surveys measuring multiple aspects of primary care, with one of them being the patient-provider relationship [survey data]	AHRQ 2011 CHSRF 2002
Alberta Continuity of Services Scale for Mental Health [multi-dimensional survey for mental health care patients; four sub-scales one of which is relationship base]	CHSRF 2002

Problems within Acute Inpatient Care

2.5 Provision of services beyond what is specified by clinical guidelines (overuse) or failure to provide medically necessary services (underuse)

For further information on this problem see: Tucker and others 2008, and Legido-Quigly and others 2013. (See table under 2.6)

2.6 Lack of horizontal integration

- Provision of services within most appropriate type of provider
- Sufficient volume of services by provider

Measures (for 2.5 and 2.6)	Source
Inguinal hernia repair performed in day surgery [%]	Estonia Health Insurance Fund 2013
Cholecystectomies performed in day surgery [%]	
Tonsillectomy/Adenoidectomy performed in day surgery [%]	

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never/nearly never - always/nearly always	2A5	Coordination of care episodes that require inpatient stays take place within the hospital at specialist level
Likert scale: never/nearly never - always/nearly always	2A11	Doctors with admitting rights to hospitals coordinate episodes of care

Problems at the Interface between Primary and Ambulatory Care

2.7 Inadequate follow-up for specialized ambulatory care as specified by disease specific clinical pathways

For further information on this problem see: Burton 2012

Problems at the Interface between Ambulatory and Acute Inpatient Care

2.8 Avoidable hospital admissions (e.g., emergency admissions)

For further information on this problem see: Legido-Quigly and others 2013.

Measures	Source
Selected potentially preventable hospitalizations • Vaccine preventable diseases • Acute conditions (infections, gastroenteritis) • Chronic conditions (diabetes, asthma, angina, hypertension, congestive heart failure, COPD) • All	Australian Institute of Health and Welfare 2013
Age standardized admission rates for • Asthma;	Kelley and Hurst 2006

• Diabetes; • Epilepsy.	
Rates of emergency admissions	Gravelle and others 2007
Rates of emergency admission for people aged 75 or over, per 1,000 population	Kelley and Hurst 2006
Emergency bed days	Gravelle and others 2007

2.9 (Avoidable) Readmission rates

For further information on this problem see: Legido-Quigly and others 2013.

Measures	Source
Rates of emergency psychiatric readmission	Kelley and Hurst 2006
Patients with repeat hospitalizations for mental illness	CHSRF 2002
Rates of emergency psychiatric readmission	Kelley and Hurst 2006
Patients with repeat hospitalizations for mental illness	CHSRF 2002
Rates of emergency psychiatric readmission	Kelley and Hurst 2006
Patients with repeat hospitalizations for mental illness	CHSRF 2002
Rates of emergency psychiatric readmission	Kelley and Hurst 2006

2.10 Early and incomplete hospital discharges

For further information on this problem see: Groene and others 2012; Kirsebom and others 2013; Hofmarcher and others 2007a, p. 37; Olsen and others 2012.

Measures	Source
Medication (aspirin, ACE inhibitor, beta blocker) at discharge after AMI	Lambe and Mattke 2004
Medication (statin) at discharge after cardiac event	
Medication (ACE inhibitor, beta blocker) at discharge after CHF	

2.11 Inadequate follow-up for acute inpatient care as specified by disease specific clinical pathways

For further information on this problem see: Burton 2012.

Measures	Source
Patients with stroke with CT/MRI scan after hospitalization	Estonia Health Insurance Fund 2013
Patients with stroke with thrombolysis after hospitalization	

Problems at the Interface between Acute Inpatient and Nursing Care

2.12 Length of stay in hospital that exceeds what is medically necessary

For further information on this problem see: Legido-Quigly and others 2013; Reed and others 2005.

Measures	Source
Rate of discharge to usual place of residence • within 56 days of emergency admission from there with a stroke (ages 50 and over); • within 28 days of emergency admission from with a fractured femur neck (ages 65 and over)	Kelley and Hurst 2006

Problems within Patient Population

2.13 Inadequate management/coordination of care by patient or family members (e.g., failure to keep appointments, failure to follow treatment regimen)

Measures	Source
First outpatient appointments for which patient did not attend [%]	Kelley and Hurst 2006

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: Never/nearly never-always/nearly always	2A1	Frequency with which patients coordinate care themselves
Likert scale: Never/nearly never-always/nearly always	2A2	Frequency with which relatives and family members take a leading role in care coordination

Health Care Integration Problems Related to the Broader Health System

Problems with System Governance

3.1 Vertical fragmentation of responsibility for providing care between different levels of government

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: strongly disagree – strongly agree	3B2	Is coordination of care impeded by vertical dispersion of responsibility for providing care

3.2 Organization of care within geopolitical areas

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: strongly disagree – strongly agree	3B3	Is coordination of care hindered by organization of care within narrow geographical areas

3.3 Physical separation of primary care and specialist services (no co-location of services)

Survey: QUALICOPC Survey (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories-existence of and type of shared accommodation	18	Shared accommodation with other GPs and/or medical specialists
Nominal categories – different types of disciplines	19	Other disciplines are working in practice/centre

Problems with Contracting and Financing

3.4 Lack of effective contractual arrangements between payers and providers to coordinate care

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: nearly never or never – always or nearly always	3D5	Extent to which payers selectively contract with providers on the basis of capacity to coordinate care or to provide coordinated care
Likert scale: nearly never or never – always or nearly always	3B5	The presence of competing multiple payers and providers reduces the incentives for payers to contract with providers to enhance care coordination

3.5 Lack of effective contractual arrangements between different health care providers to coordinate care

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never or nearly never – always or nearly always	3D6	Extent to which contractual arrangements to provide care target the promotion of cooperation among providers as an explicit objective

3.6 Lack of sufficient funding for chronic conditions care (drugs, staff costs, infrastructure, equipment, etc.)

Survey: LSHTM, Respondent: Key Informant (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	KI XI	How is hypertension financed? From what Comments? Are the funds earmarked? How much is spent on HT? What are the costs for patients?

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP XIII	Approximately what proportion of the HT care costs was funded during the last year in your facility/areas?

3.7 Negative effect of provider payment mechanisms on coordination of care

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories – payment mechanism and percentage of total income	16	Contribution of different payment mechanisms to total income
Y/N/Don't Know	17	Receipt of extra financial incentive or bonus for managing patients with chronic conditions (diabetes/hypertension), achieving screening targets or prevention targets, limiting referral rated, treating disadvantaged patients, working in a remote area

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Binary (Y/N) by health care level (primary, ambulatory specialist, hospital outpatient, acute inpatient, long-term)	2E	What are the predominant payment arrangements to individual or institutional providers? 1. FFS, 2. Capitation, 3. Salary, etc. (9 options)
Likert scale: never-always	3C4	Arrangements to provide care include a budget for the care coordinator to purchase necessary care for patients.

3.8 Lack of financial rewards for treating and improving care coordination for chronic conditions

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP XIII	Are there any financial incentives to treat HT and its complications?

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never/nearly never - always/nearly always	3C2	Arrangements to provide care include explicit payments for care coordination for primary care physicians
Likert scale: never/nearly never - always/nearly always	3C3	Arrangements to provide care include explicit payments for care coordination by other non-GP providers

3.9 Fragmentation of funding for chronic care management

Not researched.

3.10 Lack of accountability of primary care providers for

- Quality of care
- Efficiency of care

Measures	Source
Required outside reporting index	Schmittdiel and others 2006
Physician organization accepts any financial risks for hospital costs	

Problems with Mechanisms and Processes

3.11 Lack of multi/ interdisciplinary teamwork among providers to coordinate care

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Ordinal categories - frequency	44	Frequency of meeting with following professionals (either professionally or socially): Other GP, practice nurse, ambulatory medical specialist, etc. (10 options total)
Ordinal categories- frequency	45	Frequency of asking advice from following medical specialists: Pediatrician, Internist, Gynecologist, etc. (9 options total)
Ordinal categories - frequency	48	Extent to which GP is informed by medical specialists after finishing patient treatment or diagnostics

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert Scale: never/nearly never - always/nearly always	2A9	Long term care provided by multidisciplinary teams
Likert scale: never-always	3C5	Arrangements to provide care allow or encourage the formation of group practices or multidisciplinary care models

3.12 Inappropriate point of entry into the healthcare system

- Specialist ambulatory care
- Emergency outpatient
- Acute inpatient care

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never-always	2C1-2C10	Frequency with which patients enter at the healthcare system at different points (10 options)
Likert scale: never-always	3C1	Arrangements to provide care designate one provider as care coordinator (e.g. gatekeeper)

3.13 Lack of a designated responsibility for guiding patients through the healthcare system and coordinating care

- Non-physician health care professionals or (e.g., nurse, medical assistant, case manager)
- Non-health care professionals (e.g., social worker)
- Primary care physicians
- Ambulatory care physicians
- Health care insurers (e.g., health maintenance organization [HMO])

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
N/A (no nurse in my practice) or Y/N	46	Provision of immunization, health promotion, routine checks of chronically ill patients, and minor procedures by practice nurse or assistant

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale- never to always	2A3	A health-care professional at the primary care level normally guides the patient through the system and coordinates care
Likert scale- never to always	2A4	Ambulatory care specialists guide the patient through the system and coordinate care
Likert scale- never to always	2A5	Coordination of care episodes that require inpatient stays take place within the hospital at specialist level
Likert scale- never to always	2A7	Insurers (particularly managed care) coordinate care
Likert scale- never to always	2A10	Case managers at the local level are helping GPs and patients to find the most appropriate care
Likert scale- never to always	2A11	Doctors with admitting rights to hospitals coordinate episodes of care

3.14 Lack of participation of primary care physicians in disease management program

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal (binary) categories – Y/N	21	Involvement in disease management program for: COPD, Asthma, CHF, Diabetes

3.15 Failure to take patient preferences and needs into account when choosing referral destination

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories (physician/patient/both)	23	Responsibility for deciding patient referral destination
Ordinal categories-frequency	24	Extent to which the following is taken into account when referring patients: patient's preference on where to go, travel distance for patient, previous experiences with medical specialist, comparative performance of medical specialists, patient waiting time and costs

3.16 Inadequate system of procurement and distribution of drugs for chronic conditions

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP XIV	How does the procurement of HT and other HT-related drugs work? Are there any problems with this process?

3.17 Failure to maintain comprehensive and up-to-date patient medical records

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories (multiple options possible) – comprehensiveness of patient information in medical files	40	Inclusion of following information in patient medical records: Living situation, ethnicity, family history, diagnosis, prescribed medication, etc. (10 options)
Nominal categories – regularity of patient medical record keeping	41	How do you keep patient medical records: Only for regularly attending patients, routinely for all patient contacts, etc. (5 options)

3.18 Failure to use medical records to routinely monitor and coordinate patient care

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories – use of list and reason	42	Use of medical record system for listing selection of patients based on age, diagnosis or risk

3.19 Failure to efficiently share clinical records and/or information on patient needs between providers (both within and between different health care levels)

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Ordinal categories - frequency	37	Receipt of medical records from previous doctor for new patients
Ordinal categories, consistency of referral letter use.	47	Use of referral letters including details on provisional diagnosis and possible test results when referring to specialist
Ordinal categories - frequency	48	Extent to which GP is informed by medical specialists after finishing patient treatment or diagnostics

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never/nearly never - always/nearly always	2A12	Information on medical records and patient needs is routinely transmitted between providers.

Problems with Health Care Inputs

Physical resources

3.20 Lack of nursing care facilities (long term care and home care)

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never/nearly never - always/nearly always	2C7	Patients enter acute inpatient care because of a shortage of long-term care facilities, nursing care or home care

3.21 Shortage of ambulatory care providers (specialized and primary care)

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never- always	2C4	Patients go to the emergency outpatient ward because of shortage of ambulatory care providers
Likert scale: never/nearly never - always/nearly always	2C5	Patients go to the emergency outpatient ward because access to ambulatory care provider is inconvenient

3.22 Lack of comprehensive of primary care services (including medical specialties, prevention, health education and follow-up service)

Measures	Source
Severe chronic illness treated in primary care index	Schmittdiel and others 2006
Health promotion index	
Health education index	

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Ordinal categories - frequency	50	Extent to which patients contact GP first for following health problems: child with severe cough, Woman aged 18 asking for oral contraception, etc. (19 Options)
Ordinal categories - frequency	51	Extent to which GP is involved in follow-up of patients with following diagnosis: COPD, Peptic ulcer, CHF, etc. (12 options)
Ordinal categories - frequency	52	Extent to which following activities are carried out by GP or practice staff and not by a medical specialist: Wedge resection of ingrown toenail, removal of sebaceous cyst from hairy scalp, etc. (10 options)
Nominal categories -compliance with guidelines	53	When do you, or your staff, measure blood pressure?
Nominal categories-compliance with guidelines	54	When do you, or your staff, measure blood cholesterol level
Nominal categories – involvement and type	55	Involvement in health education for following topics: smoking, diet, alcohol use, exercise.
Nominal (binary) categories - involvement	56	Involvement in following activities: routine antenatal care, immunization of children, etc. (5 options)
Nominal (binary) categories - involvement	57	Provision of special sessions or clinics for diabetic patients, hypertensive patients, pregnant women, elderly.

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP X	For primary health care staff: what proportion of patients who come first to you could be treated here?
Open-ended	HCP X	PHC staff: What does it mean to ‘follow-up a patient’? Who should be responsible for it?

3.23 Inadequate supply of medical equipment in primary care settings

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories (multiple options possible) – equipment availability	25	Equipment used in practice by GP or staff: (several options in the following categories – laboratory, imaging, functions, other)

3.24 Inadequate working conditions and supply of medical equipment for management of chronic conditions

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP VI	Are the working conditions in your facility suitable for managing HT and its complications? Please list what you have [Urine test strips, glucometers, disposable syringes, etc.]
		What instruments and equipment do you need to manage HT or its complications more effectively? Are all of these available for your use?

3.25 Shortage of drugs necessary for the management of chronic conditions

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP XIV	Are there shortages in drugs and consumables? Could all people with high HT obtain all necessary drugs, the right brand, at the right time or other problems?

Human resources

3.26 Shortage of primary health care professionals (physicians, nurses, physiotherapists)

(See table under 3.27)

3.27 Lack of skills among primary health care professionals in the management of chronic conditions

For both 3.26 and 3.27:

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP VI	Have you been specifically trained to manage HT or its complications, where and when? In general, are there enough specialists able to manage complications?
Open-ended	HCP VI	Do you think there are enough health care professionals able to manage HT?

3.28 Lack of awareness among general population regarding chronic conditions management

Survey: LSHTM, Respondent: Key Informant (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	KI XIII	What is the awareness among the population, HT sufferers and health staff regarding HT, its treatment and the lifestyles changes required?

3.29 Lack of awareness among chronic condition sufferers and their families regarding chronic conditions management

Survey: LSHTM, Respondent: Key Informant (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	KI XIII	What is the awareness among the population, HT sufferers and health staff regarding HT, its treatment and the lifestyles changes required?

Technology

3.30 Lack of information on chronic condition management

Survey: LSHTM, Respondent: Patient (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	KI XIV	What information is there on HT and its complications? How is it collected and managed?

3.31 Lack of formal guidelines or protocols for the prevention and management of chronic diseases

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Binary (Y/N) by condition (cancer, circulatory System diseases, diabetes, chronic lower respiratory diseases, dementia)	4A	Please indicate if there are formal polices/programs to coordinate care that are targeted on specific conditions: 1. Care management, 2. Case management, 3. Continuing care, etc. (7 Options)

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP III	Are there any formal guidelines or protocols on how to prevent and manage HT? If any, how specific are these? Are these formulated nationally or facility-level? Do you use them?

3.32 Lack of formal pathways for management of patients with chronic conditions/diseases

Survey: LSHTM, Respondent: Health Care Professional (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	HCP X	Is the treatment and referrals to other facilities effectively organized? Does it involve unnecessary delays?

3.33 Lack of electronic medical records with a uniform platform for care coordination

Measures	Source
Presence of electronic medical record [%]	Schmittdiel and others 2006
Presence of electronic standardized problem list for patients [%]	

Survey: QUALICOPC Survey, Respondent: General Practitioner (Schäfer and others 2013)		
Measurement	**Q No.**	**Question**
Nominal categories (multiple options possible) – purpose of computer use	43	Computer use purposes: making appointments, issuing invoices, keeping records, etc. (9 options)

Survey: OECD, Respondent: Government Stakeholder Group (Hofmarcher and others 2007b)		
Measurement	**Q No.**	**Question**
Likert scale: never/nearly never - always/nearly always	3D3	Providers and payers are equipped with IT so as to encourage communication of patient information amongst themselves
Likert scale: never/nearly never - always/nearly always	3D4	A patient file in electronic format exists and contains medical information about the patient

Social resources

3.34 Lack of special rights and entitlements (benefits, pensions, exemptions, housing, etc.) for individuals with chronic diseases (including disability and other conditions)

Survey: LSHTM, Respondent: Patient (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	PA VI	Do you know what your rights are as a person living with HT? Could you list any benefits you get in reality [pensions, benefits, exemptions from exams, telephones, housing…] Where do you get them? What is the procedure?

3.35 Lack of social and advocacy groups for individuals with chronic diseases

Survey: LSHTM, Respondent: Patient (Balabanova and others 2011)		
Measurement	**Q No.**	**Question**
Open-ended	PA V	Is there a HT association of patients? Are you involved? How?

Annex

Indicators Used in the Final Study

As presented in World Bank 2015, pp. 14-15.

Avoidable Hospital Admissions

This indicator assumes that hospital admissions for certain diseases (as defined by the principal diagnosis according to the International Classification of Diseases – ICD 10), are not justified unless a certain procedure is required (as defined by the Nordic Medico-Statistical Committee Classification – NOMESCO) or certain additional diagnoses indicate a complication of the patient's condition. Avoidable hospital admission are calculated as a share of all admissions for a certain disease group (e.g., avoidable asthma admissions as a share of respiratory disease admissions) as well as age- and sex-standardized population rates.

(Source: OECD Health Care Quality Indicators (HCQI) Primary Care Indicators.)

Extended Hospital Stays

This indicator gives the proportion of patients discharged back to their usual place of residence within the internationally recognized maximum length of stay for a specific condition after their admission to the hospital. In addition, the study distinguished proportions of cholecystectomies that are conducted in a minimally (i.e., laparoscopically) vs. a non-minimally invasive manner, which requires a much longer length of stay.

(Source: US Agency for Healthcare Research and Quality - Inpatient Quality Indicator #23: Laparoscopic Cholecystectomy Rate and Compendium of Population Health Indicators Health and Social Care Information UK: Returning to usual place of residence following hospital treatment: fractured proximal femur/stroke.)

Avoidable Ambulatory Specialist Visits

Internationally, there is no universally accepted protocol or indicator to determine the validity or need for a specialist visit. This indicator looks at specialist visits by patients whose conditions are considered uncomplicated based on the primary diagnoses made. Of these, visits were considered avoidable if patients presented to a specialist not specified in national Estonian guidelines. If several visits were billed under the same claim (e.g., pertaining to one care cycle), the decision on whether these visits were avoidable was made based on the primary diagnosis code assigned to the claim.

(Source: Developed by WBG staff in collaboration with medical experts from the US. Vetted by the Estonian Association for Family Association for Family Medicine. Future

application of this protocol could benefit from the use of ePrescription data in order to better distinguish between cases that warrant specialist visits and such that do not (i.e., hypertension patients needing 3 or more agents in order to stabilize their condition should see a specialist despite their diagnosis code indicating uncomplicated hypertension).

Under-provision of Preventive Services

The indicator states for both hypertension and diabetes patients the percentage of i) patients receiving none of the tests recommended in Estonian guidelines and ii) patients receiving all the tests recommended in national guidelines. These percentages were calculated taking into account i) only tests provided by GPs, and ii) tests provided by both GPs as well as ambulatory specialists.

(Source: Quality Bonus Scheme for General Practitioners in Estonia.)

Provider Continuity

The study measured the frequency and sequence of patients' visits with primary care providers versus ambulatory specialists. The study used the following measures for the general population and the different tracer groups: average number of outpatient visits per year, percentage of outpatient visits that occur with ambulatory specialists, average number of consecutive specialist visits before seeing a family physician and average number of consecutive family physician visits before seeing a specialist (includes both doctor's office and home visits).

(Source: Reid and others - Defusing the Confusion: Concepts and Measures of Continuity of Healthcare (2002) and Sandra H. Jee & Michael D. Cabana - Indices for Continuity of Care: A Systematic Review of the Literature, Medical Care Research and Review, Vol. 63 No. 2, (April 2006) 158-188.)

Incomplete Discharges

The indicator calculates the rate at which patients with a relevant tracer condition were prescribed beta-blockers, ACE inhibitors, statins, no prescription, or all 3 prescriptions i) during their inpatient stay, ii) within 30 days of discharge and iii) within 90 days of discharge. Only patients with an acute inpatient stay and a relevant primary diagnosis code (e.g., not a secondary diagnosis) that did not decease during the 90 days after discharge were considered. Any prescription made during the entire inpatient care episode was considered as a valid prescription.

(Source: New Zealand Best Practice Evidence-based Guideline on the Assessment and Management of Cardiovascular Risk (2003) and OECD Health Technical Papers No. 14

- Selecting Indicators for the Quality of Cardiac Care at the Health Systems Level in OECD Countries.)

Inadequate Acute Inpatient Follow-up Care

The indicator states the rate of patients with a relevant tracer condition that have follow-up visits with either (i) a family physician or (ii) an ambulatory specialist within a period of either (a) 30 or (b) 90 days of discharge from acute inpatient care. Only patients with an acute inpatient stay and a relevant primary diagnosis code (e.g., not a secondary diagnosis) that did not decease within 90 days of discharge were considered for the analysis. An outpatient care visit counted as a follow-up visit if it occurred before the next inpatient care episode and if any diagnosis relevant to the tracer condition was made.

(Source: Lin, Barnato & Degenholtz - Physician Follow-Up Visits After Acute Care Hospitalization for Elderly Medicare Beneficiaries Discharged to Non-institutional Settings (2011).)

Unnecessary Preoperative Diagnostic Tests

The indicator identified unnecessary pre-operative tests performed on patients undergoing a relevant tracer surgery based on both patient factors (age and co-morbidities) and the types of surgery and tests being performed. Tests were counted as unnecessary if they were performed up to 30 days before the surgery on a patient whose surgical grade, age, and American Society of Anesthesiology (ASA) category (as constructed based on renal, cardio-vascular and respiratory co-morbidities) did not warrant the test according to the used classification. Patients were classified in ASA categories based on relevant diagnosis codes given at the time of admission for surgery or any time during the calendar year of the surgery and the preceding calendar year.

(Source: Adapted by WBG staff in collaboration with medical experts from the US based on NHS Clinical Guideline 3 on Preoperative Tests - The use of routine preoperative tests for elective surgery. Evidence, Methods & Guidance. Vetted by the Estonian Association for Family Medicine. 1. Future applications of this protocol could use ePrescription data in order to better distinguish between moderate and severe comorbidities thanks to the medications being prescribed to the patient (e.g., Asthma or COPD patients).

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