

# **NCD CARE CONTINUUM AND OPPORTUNITIES FOR ACTION WITHIN HEALTH REFORM IN UKRAINE**

DISCUSSION PAPER

DECEMBER 2020

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**WORLD BANK GROUP**  
Health, Nutrition & Population



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**December 2020**

## Health, Nutrition and Population (HNP) Discussion Paper

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# Health, Nutrition and Population (HNP) Discussion Paper

## NCD care continuum and opportunities for action within health reform in Ukraine

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Paper prepared within 'Support to Reforms and Governance in the Health Sector in Ukraine' project supported by the Swiss Agency for Development and Cooperation

**Abstract:** Ukraine is in the midst of a comprehensive health sector reform to transform the current unaffordable and inefficient system into a modern, more efficient, and affordable one. The country's health system is not addressing non-communicable diseases (NCD) and chronic conditions effectively, and NCD-related health outcomes compare relatively poorly to countries with a similar level of health financing. The paper analyzed the continuum of care for four conditions (hypertension, diabetes, breast, and cervical cancer) using the cascade framework as an analytical tool and programmatic data from two regions of Ukraine (Lviv and Poltava). It draws on global evidence of good and cost-efficient practices and includes the findings from guided discussions with Ukrainian health care planners, administrators, and providers.

The analysis found significant gaps in detection, treatment monitoring, and treatment adherence in hypertension care (the largest breakpoints were blood pressure monitoring and achieving treatment targets) and similarly in diabetes care (underdiagnosis, inappropriate or incomplete treatment monitoring, sub-optimal treatment success). In breast cancer care, there was inadequate screening coverage among eligible women, post-screening losses, and a lack of documentation regarding treatment outcomes. In cervical cancer care, the screening intervals for covered women were short, creating inefficiencies, while many women were not screened despite program eligibility, and there was also a lack of long-term monitoring of women who had undergone treatment.

The authors discuss the methodological approach of analyzing routine medical records and cancer registry data and triangulating data across multiple data sources. Important lessons and policy implications include the need to revise sequence of services, focus on follow up and retention in care, develop systems for managing risk factors, and strengthen the monitoring and data recording of NCD cases. Improved NCD care would save lives, reduce disability, save resources in health care, and reduce the impact of NCDs on individuals and society.

**Keywords:** non-communicable diseases, NCD continuum of care, chronic care models, primary health care

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## Abbreviations

ABC	Glucose (A), blood pressure (B) and LDL cholesterol (C) monitoring
ABPM	Ambulatory Blood Pressure Monitoring
ACE	Angiotensin-converting-enzyme
BP	Blood Pressure
BMI	Body Mass Index
BC	Breast Cancer
BSE	Breast Self-examination
CVD	Cardiovascular Disease
CC	Cervical Cancer
CBE	Clinical Breast Examination
CHW	Community Health Worker
DNA	Deoxyribonucleic Acid
EMR	Electronic Medical Record
FPG	Fasting Plasma Glucose
HbA1C	Glycated Hemoglobin
GNI	Gross National Income
HIC	High-income Country
HPV	Human Papillomavirus
HTN	Hypertension
IGT	Impaired Glucose Tolerance
IDF	International Diabetes Federation
LDL	Low-density lipoprotein
LMICs	Low- and Middle-income Countries
MoH	Ministry of Health
NCD	Noncommunicable Disease
OOP	Out-of-Pocket
PHC	Primary Health Care
SPIH	Serving People, Improving Health
STEPS	STEP-wise Approach to NCD Surveillance
T2DM	Type 2 Diabetes Mellitus
TNM	Tumor, Node, Metastasis
UMIC	Upper-middle-income Country
VIA	Visual Inspection with Acetic Acid
WHO	World Health Organization
WHO-PEN	WHO Package of Essential NCD Interventions
YLD	Years Lived with Disability
YLL	Years of Life Lost



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# Chapter 1: Overall Health Reform and NCD Situation in Ukraine

## Overview of Ukraine's Health System and Reform

Ukraine is in the midst of a comprehensive health sector reform, with concerted efforts by the government, in collaboration with international partners, to transform the current unaffordable and inefficient system into a modern, efficient, and affordable one (World Bank 2017). Remnants of the historical, centralized Semashko system still form many of the foundational parts of the health system, which was set up under the Soviet Union (Lekhan et al. 2015; Twigg 2017). The consequences of failing to reform the system for so long has led to an oversized and inefficient system, one that is largely focused on specialty rather than preventive care (Twigg 2017; World Bank 2017).

**Ukraine's health system is in need of paradigm shifts** to address its hospital-centric system, input-based financing, unaffordable universal health care coverage model, and its focus on curative rather than preventive care. Its hospital-centric system is neither effective nor efficient, with over 60% of health expenditure going directly toward inpatient care (World Bank 2017). The few leftover resources have not been adequate to support the growth of a comprehensive primary health care (PHC) system. Health budgets have traditionally been based on historical allocations, instead of considering changing needs, and on inputs rather than services delivered. The unaffordability of a universal health care coverage model has led to significant informal payment mechanisms and a system in which patients often bypass the PHC level altogether to either self-treat or self-refer to specialty care (International Renaissance Foundation, Kyiv International Institute of Sociology, and School of Public Health of the National University of Kyiv-Mohyla Academy 2018; Lekhan et al. 2015; World Bank Group 2017). Ukraine's public health system is primarily focused on curative rather than preventive services, leading to weak capacity for the promotion of healthy living and the primary prevention of major noncommunicable diseases (NCDs).

As part of the ongoing health reform initiatives, in 2018, the Ministry of Health (MoH) of Ukraine developed a new health care financing mechanism with a 'money follows the patient' model. This is in direct contrast to the historical financing system in which budgets are backward-looking and based on the previous year as well as the number of staff and beds in facilities. Strategies to shift toward PHC being the point of entry into the health care system have included a national policy to allow patients to choose their own family doctor through a signed agreement/declaration, with salaries of health care providers linked to the number of patients they see. As of November 2020, 31 million Ukrainians (over 70% of the population) had already signed declarations choosing their PHC physician.<sup>1</sup> The MoH has committed to creating a transparent health benefit package, which is called a Program of Medical Guarantees.

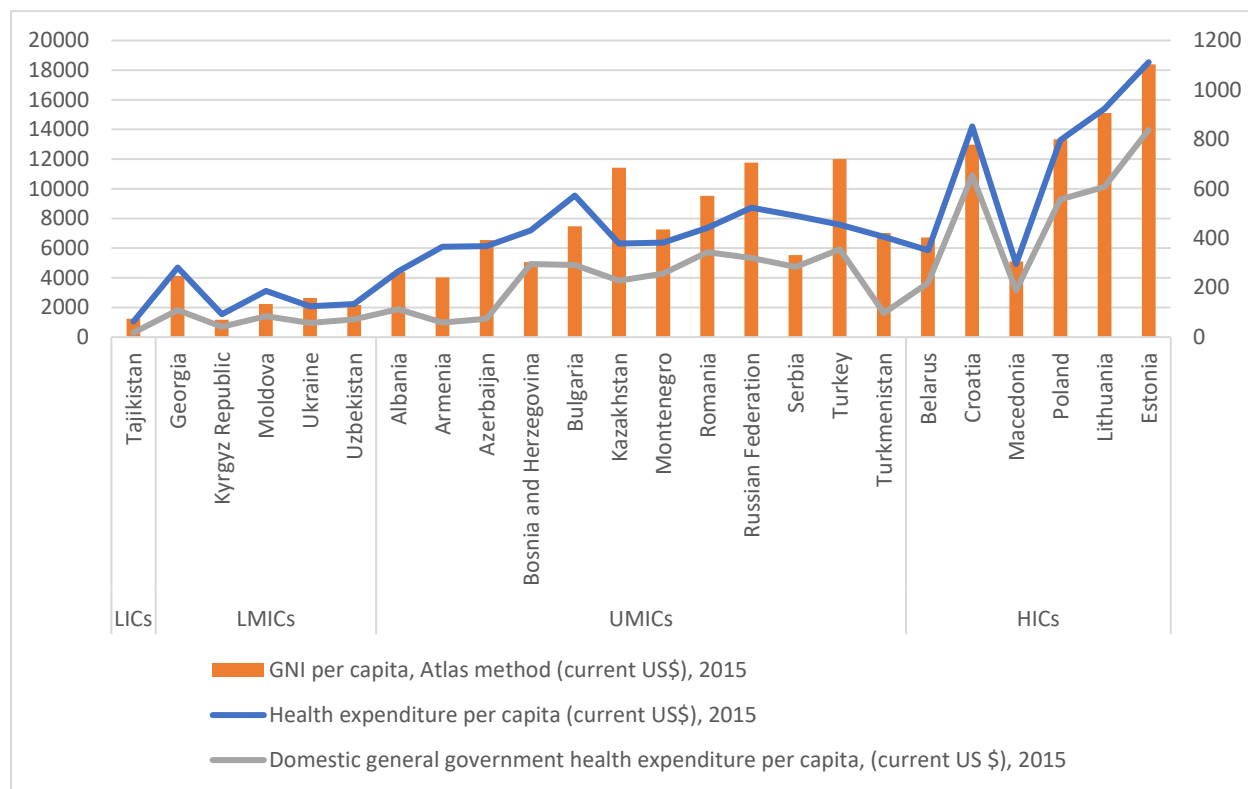
**Ukraine has a relatively low investment in health compared to countries in the same income group and across the region.** The low investment in health is particularly concerning as Ukrainians are suffering from comparatively high disease burdens. For instance, the life expectancy in Ukraine is 71 years of age,<sup>2</sup> almost 10 years lower than the European average, and the adult mortality rate is higher than the average for countries in the Europe and Central Asia region, particularly for men (World Bank 2017). In addition to poor health outcomes, Ukrainians are left with paying a large percentage of the overall health cost in out-of-pocket (OOP) payments, up to almost 50% of total health expenditures (World Bank 2017).

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<sup>1</sup> <http://en.moz.gov.ua/article/news/every-second-ukrainian-has-already-chosen-a-phc-physician> [Every second Ukrainian has already chosen a PHC physician].

<sup>2</sup> The World Bank Data. *Life Expectancy at Birth, Total (Years)*. <https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=UA>.

Figure 1.1: Comparison of GNI, health expenditure per capita, and domestic general government health expenditure per capita



Source: The figure includes data from available World Bank Europe and Central Asia Region + Lithuania and Estonia as comparator countries, data retrieved from World Bank Databank, and references to the following data sources: GNI per capita from World Bank national accounts data, and OECD National Accounts data files, health expenditure per capita and domestic general government health expenditure per capita from World Health Organization (WHO) Global Health Expenditure database.

Note: GNI = Gross national income; HICs = High-income countries; LICs = Low-income countries; LMICs = Low and middle-income countries; UMICs = Upper-middle-income countries.

## NCD Situation in Ukraine and Its Link to Health Care Reform

**Ukraine is doing poorly in addressing NCDs** or “chronic conditions that do not result from an (acute) infection process” (CDC 2013). The burden of deaths, disability, and years lost due to NCDs is high, as NCDs account for the main cause of morbidity and mortality.<sup>3</sup> Table 1.1 shows how Ukraine compares in NCD burden with other countries of similar economies (using the GNI as a matching variable and applying a range of ± 20% for the GNIs). Ukraine’s low performance compared to the countries below is apparent, as it ranked last out of the selected countries in years of life lost (YLLs) and years lived with disability (YLDs). The YLL measure is particularly alarming, as it indicates that Ukraine ranked last in premature death. Ukraine appears to have a more positive measure in life expectancy ranked at 7, but the number is actually quite poor, as all of the countries with poorer life expectancy rankings have tropical infectious diseases affecting child survival (and several countries also having challenges of geographic remoteness). In summary, Ukraine is doing poorly in addressing NCDs, as indicated by the data on premature deaths

<sup>3</sup> State Statistical Services of Ukraine. Total Number of Deaths from 5 NCDs Groups (ICD-10 codes included C00-D48, E10-E14, F00-F99, I00-I99, J40-J47) Divided by Total Number of Deaths in 2017 in Percentage.

when compared to nations with similar economies. This suggests an urgent need to transform Ukraine's health system to better address the current epidemic of chronic diseases.

Table 1.1: Ukraine NCD burden comparison with other countries of similar economies in 2017

	GNI per capita <sup>a</sup>	Deaths (rate per 100,000, all NCDs, all ages) <sup>b</sup>		YLLs (rate per 100,000, all NCDs, all ages) <sup>b</sup>		YLDs (rate per 100,000, all NCDs, all ages) <sup>b</sup>		DALYs (rate per 100,000, all NCDs, all ages) <sup>b</sup>		Life expectancy at birth <sup>c</sup>	
		US\$	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Years
Solomon Islands	1,920	413	7	12,707	9	7,186	4	19,893	8	71.0	8
Uzbekistan	1,980	533	10	12,941	10	7,451	6	20,392	9	71.4	7
Nigeria	2,080	207	1	7,201	2	6,457	1	13,659	1	53.9	14
Nicaragua	2,130	281	2	6,716	1	7,100	3	13,816	2	75.7	3
Vietnam	2,170	498	8	11,027	6	8,155	10	19,182	6	76.5	1
Moldova	2,180	1,005	13	20,361	12	10,884	13	31,245	13	71.7	6
Honduras	2,250	337	5	8,331	4	6,849	2	15,181	4	73.8	4
Lao PDR	2,270	411	6	12,365	8	7,267	5	19,632	7	67.0	10
Sudan	2,380	312	4	10,503	5	7,749	9	18,252	5	64.7	13
Ukraine	2,390	1,401	14	26,807	14	11,923	14	38,730	14	71.8	5
Papua New Guinea	2,410	572	11	20,837	13	7,703	8	28,540	12	65.7	12
Bhutan	2,720	307	3	7,577	3	7,553	7	15,129	3	70.6	9
Kiribati	2,780	586	12	19,416	11	8,171	11	27,587	11	66.5	11
Morocco	2,860	517	9	11,745	7	10,363	12	22,109	10	76.1	2

Sources: a. World Development Indicators (GNI per capita, Atlas method [current US\$] 2017); Institute for Health Metrics and Evaluation. Global Burden of Disease, 2015. Retrieved October 29, 2018 from <http://ghdx.healthdata.org/gbd-results-tool>; b. IMHE 2017a; c. The World Bank. Databank. <https://data.worldbank.org/indicator/SP.DYN.LE00.IN>.

Note: DALYs = Disability-adjusted life years.

The burden of NCDs in Ukraine is large, linked to 82%<sup>4</sup> of total deaths in 2017 from five major NCDs, that is, cardiovascular diseases (CVDs), diabetes, cancers, chronic obstructive pulmonary, and mental health diseases; most of the deaths are caused by cardiovascular diseases (67%) and cancers (14%). Almost 30% of men who died in 2017 from NCDs are in the working age group of 30–65 years;<sup>5</sup> this is coined the 'missing men' phenomenon. While a high burden of NCDs is not in contrast to what HICs experience, the burden of premature death in Ukraine is significant. The probability of dying between the ages of 15 and 60 years is much higher in Ukraine than other European countries and almost twice as high for men. There is an estimated 29% risk of premature death from major NCDs (probability of dying between the ages of 30 and 70 years, as per the 2015 estimated age-specific death rates, from the four main NCDs: CVDs, cancer, diabetes, and chronic respiratory disease) (WHO 2017a).

<sup>4</sup> State Statistical Services of Ukraine. Total Number of Deaths from 5 NCDs Groups (ICD-10 codes included C00-D48, E10-E14, F00-F99, I00-I99, J40-J47) Divided by Total Number of Deaths in 2017 in Percentage. [http://database.ukrcensus.gov.ua/MULT/Dialog/statfile\\_c.asp](http://database.ukrcensus.gov.ua/MULT/Dialog/statfile_c.asp).

<sup>5</sup> State Statistical Services of Ukraine ([http://database.ukrcensus.gov.ua/MULT/Dialog/statfile\\_c.asp](http://database.ukrcensus.gov.ua/MULT/Dialog/statfile_c.asp)).

Not unlike global trends, CVDs represent the leading burden of disease in Ukraine by far (IMHE 2017a, February 28, 2019). Table 1.2 depicts the high burden of CVD in Ukraine. When compared to other regional countries, Ukraine has the second-highest burden in terms of DALYs after Bulgaria and the third highest in terms of YLLs after Belarus and Montenegro. The data show an urgent need to scale up prevention and better care for CVD in Ukraine. The following sections focus on prevention and care for hypertension (HTN), one of the main drivers of CVD in Ukraine.

Table 1.2: CVD burden comparison with the World Bank's Europe and Central Asia Region + Lithuania and Estonia

Income classification	Country (available World Bank Europe and Central Asia Region + Lithuania and Estonia)	DALYs (% , 2017, both sexes, all ages, CVDs)	YLLs (% , 2017, both sexes, all ages, CVDs)
LIC	Tajikistan	14.63	19.34
LMIC	Georgia	34.53	47.35
	Kyrgyz Republic	20.57	30.1
	Moldova	29.02	41.71
	<b>Ukraine</b>	<b>35.74</b>	<b>48.59</b>
	Uzbekistan	26.44	37.81
UMIC	Albania	27.28	43.96
	Armenia	25.89	39.13
	Azerbaijan	26.24	36.78
	Belarus	33.79	49.06
	Bosnia and Herzegovina	26.95	41.11
	Bulgaria	37.51	52.71
	Kazakhstan	25.63	36.11
	Montenegro	31.49	48.76
	Romania	30.56	44.23
	Russian Federation	30.5	42.56
	Serbia	30.27	44.36
	Turkey	15.68	26.93
	Turkmenistan	27.19	37.17
HIC	Croatia	24.49	37.83
	Macedonia	28.97	45.65
	Poland	22.14	33.83
	Lithuania	29.34	41.84
	Estonia	25.55	39.38

Source: IMHE 2017a, February 26, 2019.

Ukraine's burden of some other NCDs, based on best current estimates, is perhaps less alarming for now. Out of the 24 regional countries compared, Ukraine ranked the second lowest in DALYs for diabetes mellitus, way below the regional average of 3.3% for DALYs (% , 2017) (IMHE 2017a, February 27, 2019). Ukraine ranked the ninth lowest out of 24 in mortality (deaths, % , 2017) due to breast cancer (BC) and the fourth lowest in mortality (deaths, % , 2017) due to cervical cancer (CC) (IMHE 2017a). While diabetes mellitus, BC, and CC remain major NCDs in Ukraine, their burden is less significant than CVD. The current system of care to address these NCDs, however, sheds light on issues that need to be tackled in Ukraine, which will be discussed in detail in later sections.

The main risk factors associated with DALYs in Ukraine for 2017 were linked to popular metabolic, environment/occupational, and behavioral factors. Specifically, the top 10 risk factors behind death and disability were dietary risks, high blood pressure (BP), tobacco, alcohol use, high LDL, high body mass index (BMI), high fasting plasma glucose (FPG), air pollution, impaired kidney function, and low physical

activity.<sup>6</sup> With current initiatives to build a PHC system, there has been momentum to shift the focus from curative to preventive care. If successful, it will allow Ukraine to better address its NCD burden as well as ability to manage chronic diseases, particularly with these behavioral risks in mind. The current health system, heavily focused on facility-based care, is not suitable for effectively tackling the increasing NCD challenges. The modern NCD control involves behavior changes, addressing risk factors, patient-centered care, and other interventions that must begin at the primary level of care.

There has been some progress in addressing NCDs, particularly in reducing tobacco and harmful alcohol use through increased taxes, smoke-free policies, and restrictions on availability and health warnings. In addition, there has been a public awareness campaign on physical activity, guidelines for management of cancer, CVD, diabetes, and chronic respiratory disease (CRD), and some measure to prevent heart attacks and strokes. To address issues with public health in line with the health reform, the government approved the National Action Plan for Non-Communicable Diseases to achieve global goals of sustainable development. Although the plan is still in the early stages of development, the government has demonstrated progress with the approval of the plan in July 2018.

The adopted document calls for the following:

- ▶ Developing a public health system
- ▶ Strengthening the public health system's education process—through including the skills of control and psychological impact on patients exposed to NCD risk factors in the conformity with medical ethics principles in the curricula
- ▶ Implementing an information policy through improving health care legislation—supporting the development and/or adaptation of international information materials and broadcasting and publicly disseminating the audiovisual information on NCD risk factors and healthy lifestyles
- ▶ Improving legislation using international best practices for a complete ban of advertising and sales promotion of tobacco and alcoholic beverages, as well as developing and approving appropriate standards and regulations consistent with strategic documents of the United Nations and the European Union aimed at reducing the negative impact of the environmental factors on the public health
- ▶ Increasing public awareness about the risk factors of NCDs (that is, tobacco smoking, alcohol use, unhealthy diet, lack of physical activity, and so on) and ways of reducing them
- ▶ Reducing premature mortality from noninfectious diseases (CVDs, cancer, diabetes, chronic respiratory diseases, and so on)

Implementation of the National Action Plan for Non-Communicable Diseases to achieve the global goals of sustainable development will allow Ukraine to achieve the following objectives by 2030:

- ▶ To reduce premature mortality from NCDs (CVDs, cancer, diabetes, chronic respiratory diseases, and others) by one-third
- ▶ To reduce alcohol abuse by at least 10%
- ▶ To reduce the prevalence of low physical activity by 10%
- ▶ To reduce salt consumption by 30%

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<sup>6</sup> IHME Global Burden of Disease Ukraine Country Profile. *Top 10 Risks Contributing to DALYs in 2017, All Ages, Number*. Retrieved February 27, 2019 from <http://www.healthdata.org/ukraine>.

- ▶ To reduce the prevalence of consumption of tobacco products by people over the age of 15 to 18.5%
- ▶ To stop the increase in obesity and diabetes morbidity
- ▶ To reduce death by road accident by 25% (MoH 2018)

The Government of Ukraine, including the MoH and other ministries, has committed to and made strides in reforming the health system, including efforts to specifically address the NCD burden. For instance, the state now provides reimbursement of medicines through a national program for CVDs, asthma, and type 2 diabetes. Included in the drugs for CVDs is a list of drugs for HTN treatment, which therefore act as CVD preventive treatments.

The progress in health reform thus far shows promise for the advancement in addressing the high NCD burden, but the work is only just beginning. **The World Bank, with support from the Swiss Agency for Development and Cooperation, implements the technical assistance program ‘Support to Reforms and Governance in the Health Sector in Ukraine’.** As part of this project, promoting the strengthening of the PHC sector through the support of addressing NCDs has been identified as a core objective. Starting in 2016, the World Bank, together with two pilot regions, Lviv and Poltava, conducted a ‘cascade analysis’ for HTN, diabetes, CC, and BC (see Chapter 3). In October 2018, the findings were presented at a joint event with Regional Health Departments from around the nation to discuss the results and identify strategies to target NCDs in Ukraine. This report provides background information on the NCD burden in Ukraine (Chapter 1) and globally (Chapter 2), describes the cascade analysis methodology (Chapter 3), displays the main findings of the NCD cascade analyses carried out in Lviv and Poltava (Chapters 4–7), and provides qualitative insights gathered from regional health managers on NCD care in October 2018 (Chapter 8).

#### **World Bank, Ukraine - Serving People, Improving Health (SPIH) Project**

The US\$215 million SPIH Project is one of the World Bank’s largest health projects in Europe, which is designed to support implementation of reforms at the central and regional levels. The project is composed of three main components: (1) improvement of service delivery at the local level with subprojects in eight regions of Ukraine (each subproject has its own objectives and structure, but **the focus is to improve the quality of care for NCDs at the primary and secondary levels of care**); (2) support reforms at the central level, including information management (e-Health), new financing and provider payment mechanisms, public health interventions, capacity building, and information and communication support; and (3) project management and monitoring and evaluation, including better measurement and use of data at both central and regional levels.

**The World Bank has been implementing a project financed by the Swiss Agency for Development and Cooperation to support reform at the regional level and improve governance in the sector.** The key activities in the project include:

- Hospital master plans;
- Public health;
- Capacity building;
- Rural medicine and telemedicine; and
- Governance and citizen engagement.

Lviv and Poltava regions are situated in the western and central parts of Ukraine, respectively. These two regions can therefore to some degree represent the situation in the country, however, each region has different health infrastructure and capacity. Their populations were as of February 1, 2019 are 2,520,312 (Lviv region) and 1,399,157 (Poltava region).



Both regions have been early adopters of the health care reform: as of December 2019, 81% of the population of Lviv region and 80% of the population of Poltava region had signed declarations with family doctors. During recent years, Lviv region has paid a lot of attention to capacity building for healthcare management staff. Within the SPIH project, Lviv region scaled-up cancer prevention services and the implementation of effective modern cancer treatment strategies. The main results of the project were: (i) early detection of breast cancer (stages 0 and 1) increased to 28% in 2019 from the baseline of 23% in 2015; (ii) early detection of cervical cancer reached a ratio of 0.88 of in-situ cases to all cases of invasive cervical cancer compared with the baseline of 0.81; and (iii) the number of organ-sparing surgeries for breast cancer in 2019 increased to 45% from the baseline of 25% in 2015.

Given its openness to innovation, Poltava was selected to pilot a new financing model for specialized healthcare facilities. The scheme entailed paying for hospitalization cases and – using a global payment rate - trialing the contracting with secondary healthcare facilities. Providers were required to report on health services delivered and carry out data verification and payments. Detailed data on the number and type of hospitalizations were collected to inform decisions on provider payments for nation-wide scale up of hospital payment reform.

The World Health Organization (WHO) has been providing technical assistance to the MoH of Ukraine in decreasing NCD-related morbidity and mortality in line with the WHO Global Programme of Work and priority interventions outlined in the Biennial Collaborative Agreements between the WHO Regional Office for Europe and the MoH of Ukraine:

#### **Technical assistance by the World Health Organization, Ukraine**

##### **Strengthen leadership, governance, policy, and intersectoral action and partnerships in the area of NCDs**

The WHO has been working closely with the MoH on policy formulation and implementation:

- Ukraine's National Action Plan for Non-Communicable Diseases has been developed in light of the United Nations Sustainable Development Goals. The plan has been approved by governmental bodies and the Cabinet of Ministers of Ukraine.
- The development of intersectoral policies on reducing three leading NCD risk factors in Ukraine: tobacco, alcohol, and healthy nutrition.
- In 2018, the WHO evaluated the 'Affordable Medicines' Program that provides medications to patients with NCDs. Through policy dialogue and technical and strategic support, the Government of Ukraine extended the program into 2019 through state funding, thereby increasing the access to and affordability of the medicines and enhancing the financial risk protection of the Ukrainian population, especially for the vulnerable groups.

##### **Strengthen prevention, management, and support of patients with NCDs and underlying risk factors in clinical and community settings**

With the aim of strengthening prevention, early detection, and the management and care of NCDs at the primary health care level with a focus on CVDs (leading cause of mortality and morbidity in Ukraine), the WHO supported the MoH of Ukraine with the following efforts:

- The development of 'Essential Training for Primary Health Care (PHC) Workers on the Integrated Management of Hypertension and Diabetes' based on the WHO Package of Essential NCD Interventions (WHO-PEN) for PHC, recommendations of the European Society of Cardiologists, and national clinical guidelines. The training was implemented through medical universities and colleagues of post-graduate education and multiple cascade training events for PHC workers in seven pilot regions of Ukraine. This is the first time that training courses of this nature have been developed and then delivered at such a scale in Ukraine.
- The establishment of smoking cessation service that was launched in June 2017.

##### **Reduce risk behaviors that influence NCD mortality and morbidity in the Ukrainian population through effective communication**

- The WHO supported the MoH with the development of the first-ever national NCD communication strategy aimed at improving mass media communication and influencing individual behavior to reduce four main NCD behavioral risk factors (tobacco, alcohol, unhealthy diet, and low physical inactivity).
- Journalists were trained to improve their understanding of how to communicate better on NCD-related topics.
- An online media repository of tools on NCDs was developed.
- Special efforts were made to support communication activities aimed at reducing alcohol consumption in Ukraine given its high prevalence and contribution to mortality and disability.

**Reduce risk behaviors that influence NCD mortality and morbidity in the Ukrainian population through special settings such as schools**

- The WHO supported interventions on strengthening NCD prevention and health promotion in school settings.
- An action plan was developed using the interagency framework Focusing Resources on Effective School Health (FRESH) framework (whole-of-school approach) that included the following key areas: (1) equitable school health policies; (2) safe learning environment as it relates to NCD prevention and healthy lifestyle promotion; (3) skills-based health education; (4) school-based health services; and (5) cross-cutting themes (partnership between health and educational sectors, community participation, including parents and child participation).
- The action plan was used to produce and implement relevant interventions under each area. The assessment of these interventions is ongoing.

**Strengthen NCD surveillance, monitoring, and evaluation**

- The WHO supported the next rounds of two large, population-based nationwide surveys, namely the Global Adult Tobacco Survey (2017) and the Global Youth Tobacco Survey (2017), to monitor tobacco use and track key tobacco control indicators to enhance countries' capacity to design, implement, and evaluate tobacco control programs.

There was close collaboration between the World Health Organization and the World Bank project "Serving People, Improving Health" and sharing of resources. Examples include the joint strategic planning of interventions in the regions, sharing of training materials, decision-support tools, resources for communication and results of research activities and monitoring and evaluation, and sharing of trained experts, personnel and training activities for PHC professionals in the World Bank-supported regions and WHO.<sup>7</sup>

In 2019, the WHO Ukraine initiated the implementation of the STEPwise approach to NCD surveillance (STEPS) in collaboration with the World Bank. The STEPS, undertaken for the first time in Ukraine, aims to assess the prevalence of behavioral and metabolic risk factors that lead to NCDs among the adult population, as well as to build and strengthen the country's capacity on NCD surveillance.

WHO Ukraine has also worked on reducing tobacco use in a way that supports ratification of the Protocol to Eliminate Illicit Trade in Tobacco Products and has advocated the development of several anti-tobacco legislative documents. Such protocols and laws could eventually allow the elimination of all forms of illicit trade in tobacco products.<sup>8</sup> WB supported this process with technical assistance and provided an analytical study on Modeling the Long-Term Health and Cost Impacts of Reducing Smoking Prevalence through Tobacco Taxation in Ukraine<sup>9</sup>

<sup>7</sup> [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/425763/Tackling-noncommunicable-diseases-in-Ukraine-2015-2019.pdf](https://www.euro.who.int/__data/assets/pdf_file/0009/425763/Tackling-noncommunicable-diseases-in-Ukraine-2015-2019.pdf)

<sup>8</sup> [https://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/425763/Tackling-noncommunicable-diseases-in-Ukraine-2015-2019.pdf](https://www.euro.who.int/__data/assets/pdf_file/0009/425763/Tackling-noncommunicable-diseases-in-Ukraine-2015-2019.pdf)

<sup>9</sup> <http://documents1.worldbank.org/curated/en/559401490166268124/pdf/113641-WP-PUBLIC-FINAL-TT-Ukraine-weonly.pdf>

## Chapter 2: Global Evidence on Four Key NCDs

The high burden of NCDs is not unique to Ukraine. In fact, NCDs are the leading cause of mortality worldwide, disproportionately affecting those in LMICs (WHO 2018). It is estimated that NCDs are the cause of 71% of deaths globally, with the largest burden related to CVD, cancer, respiratory diseases, and diabetes (WHO 2018). Various NCDs are linked to genetic risk factors and disease occurrence and outcomes are affected by lifestyle and behavioral patterns, the stage and severity of the disease when diagnosed, and the capacity of health systems to appropriately treat the condition.

As Ukraine moves toward more targeted policies and care mechanisms to address NCDs, we assessed the continuum of care using four conditions (HTN, diabetes, BC, and CC). By choosing conditions that are both screenable and require adherence to treatment over a longer time, we could investigate all major parts of the care continuum. To better understand good practices, we first looked at the global evidence on prevention, screening, targeting, treatment, and cost-effective approaches for these four conditions.

### Hypertension

#### Overview

HTN, or high BP, is a significant health concern, both as a stand-alone condition and as it relates to the development of additional health problems. High BP is recognized as one of the leading risk factors for mortality and disability worldwide, attributable to 40% or more of deaths in many countries (Wong and Campbell 2016). It is considered one of the major but modifiable risk factors for the development of CVDs and other serious medical conditions such as stroke and kidney disease (IMHE 2017b and Jeemon et al. 2017). Recent data have estimated that close to 20% of global deaths are linked to increased systolic BP, including even those individuals whose elevated BP did not yet reach the classification of HTN (IMHE 2017b). Good HTN control is usually attainable with lifestyle changes and pharmaceutical interventions. Behavioral risk factors linked to HTN include high salt and alcohol consumption, physical inactivity, and poor stress management (WHO 2013). Trends have indicated that BP has been growing around the globe over the past two decades, with the greatest percentage increase in deaths related to systolic BP occurring in LMICs between 1990 and 2015 (IMHE 2017b).

HTN is the single most important risk factor for heart disease, and 45% of heart disease mortality is attributable to HTN (WHO 2013). All CVDs combined, including heart disease, are the number one cause of death globally (WHO 2017b), accounting for an estimated 32% of all deaths in 2017 (IMHE 2017a). The global cost of CVD is substantial, estimated at US\$863 billion in 2010, and the cost is expected to rise to US\$1,044 billion by 2030. This cost includes an estimated US\$474 billion related to direct health care costs and US\$389 billion related to loss of productivity from disability, time lost from work, or premature death (Bloom et al. 2011). The impact on LMICs is great, with three-fourths of the total CVD deaths occurring in those nations. There have been a number of policy approaches to target this enormous burden, including initiatives to decrease tobacco use, promote healthy diets, and increase physical activity (Gaziano et al. 2017). Policy measures vary in type and there remains debate on which initiatives are most effective, but there is expert consensus that early detection and appropriate care mechanisms are essential, as are individual and community awareness and risk reduction.

As countries plan to tackle the enormous health burden related to HTN, it would be relevant to look not just at the burden of HTN but also at increased systolic and diastolic BP, CVDs, and other associated health issues such as diabetes, stroke, and kidney disease. This section, however, focuses specifically on global evidence related to HTN. HTN can be used as a tracer condition for chronic, long-term care and can therefore help understand the health system's performance in providing continuity of care—from detection to treatment maintenance and success.

Figure 2.1: Global lessons on successful HTN management (taken from Hypertension Care in Ukraine: Breakpoints and Implications for Action)

**BLOOD PRESSURE CONTROL HAS BEEN A CORNERSTONE OF THE PREVENTION OF STROKE, ISCHEMIC HEART DISEASE, AND PERIPHERAL VASCULAR DISEASE FOR DECADES**

- ▶ Screening to find hypertensive cases is important for disease prevention
- ▶ Blood pressure control is cost-effective in all regions of the world

**RECENT FOCUS ON HTN/CVD CONTROL**

- ▶ Improving efficiency of identifying those who will most benefit from treatment
- ▶ How to improve access to medications, especially at the outpatient level
- ▶ How to improve adherence to medications and deliver them consistently

**TREND TOWARDS EVALUATING OVERALL RISK RATHER THAN SINGLE FACTOR**

- ▶ More cost-effective if overall CVD risk is assessed, not BP or cholesterol levels alone
- ▶ Shifting responsibility for screening to community health workers (CHWs) is effective
- ▶ Concentration on the most at-risk patients (with difficulty to control HTN)
- ▶ Screening by using a mobile phone app

**REGARDLESS OF SCREENING LOCATION, ONCE IDENTIFIED, MOST PRIMARY PREVENTION FOR ISCHEMIC HEART DISEASE AND STROKE WILL OCCUR IN PRIMARY HEALTH CENTRES**

- ▶ Training and skills of primary care personnel are an important factor
- ▶ CHWs can help improve adherence once individuals are on HTN treatment
- ▶ Participation and motivation of patients

*Source:* Summarized from Jeemon et al. 2017.

### Screening/prevention

Screening for HTN is relatively simple, is low cost, and can be performed by low-cadre health personnel or even trained lay persons. The measurement of BP is in many health care systems part of the routine protocol of health consultations or annual checkup visits (Jeemon et al. 2017). The integration of BP assessment at every PHC visit by adult clients serves to identify hypertension early and systematically, and some PHC systems place vital signs stations strategically for best client flow (A Step-by-Step Manual to Guide Implementation 2020). Early detection of elevated BP and HTN is important, as it allows the reduction of BP through treatment and prevents HTN and the serious health conditions associated with it. High rates of morbidity and mortality linked to HTN worldwide point to the need for health systems to have effective and efficient screening and early detection in place. Screening for HTN is particularly important, since the condition is largely asymptomatic and a high proportion of HTN cases go undetected and/or untreated. In HICs, strategies to promote early detection and treatment of HTN along with public health policies have resulted in a decline in mortality due to heart disease and stroke (WHO 2013).

Typical screening for BP will begin with measuring a patient's BP using an office- or clinic-based method. The two main clinic-based tools are the auscultatory method, which is a manual method reliant on a stethoscope and trained observer, and the oscillometric method, which uses a pressure transducer to measure systolic and diastolic BP (Piper et al. 2014). To minimize the effect that office settings can have on BP measurements ('white coat syndrome'), multiple measurements may be taken during one visit or preferably over several visits.

The use of non-clinic measurement tools is becoming more common, especially to confirm a diagnosis of HTN after an initial clinic measurement warrants further testing. Non-clinic-based measurement tools include ambulatory blood pressure monitoring (ABPM), which uses a small portable machine to record BP at regular intervals over a period, and home blood pressure monitoring, which uses automated oscillometric devices that record BP. Non-clinic measurement tools are seen as effective diagnostic tools since they

allow for a greater number of measurements of a patient's BP over a specific period and provide more valid readings, as a patient's BP can be affected by a number of outside factors. For instance, evidence has shown that BP measurements taken at a medical clinic tend to be higher than a patient's BP during normal daily life activities. There is some evidence to point to ABPM being the best method for diagnosing HTN and reducing overtreatment of HTN that can sometimes occur due to higher measurements recorded during office visits (Siu 2015). International guidelines, including from the United States and Great Britain, recommend the use of ABPM to confirm an HTN diagnosis, but this practice may be less feasible in low-resource settings (Jeemon et al. 2017). In such settings, reliance on clinic-based measurements may be more desirable until a health system builds enough capacity to implement home-based programming.

Screening, prevention, and treatment of HTN can be addressed at the PHC level (Gaziano et al. 2017; WHO 2013). The goal of HTN treatment is to reduce a patient's BP to a target level; however, any reduction of BP is considered beneficial (Jeemon et al. 2017). Disparity in access to treatment and drug therapy for HTN is a concern in LMICs. Even if available in the country, individual and community access to recommended treatment has been estimated at less than 10% in some LMICs (Gaziano et al. 2017), with barriers related to long wait times at primary health centers, professional health staff deficits, high costs of traditional screening programs (Jeemon et al. 2017), and high cost of treatment for patients (WHO 2013). The control of BP has long been known to help in the prevention of CVD and other diseases and there is growing evidence focused on improving efficiency of identifying patients who most benefit from treatment, access, and adherence to medications (Jeemon et al. 2017).

#### Targeting of case finding and cost-effectiveness considerations

Good practice strategies in non-pharmacological treatment for the reduction of BP include weight loss, reduction in alcohol and salt intake, and smoking cessation (Jeemon et al. 2017). In cases where non-pharmacological interventions are attempted and are insufficient to reach a desired BP level, a patient's treatment can expand to include a number of pharmacological treatments. Although reaching HTN control is feasible with appropriate interventions, control rates for HTN have been found to be at about 9.9% in LMICs and less than 5% in some countries (Gaziano et al. 2017).

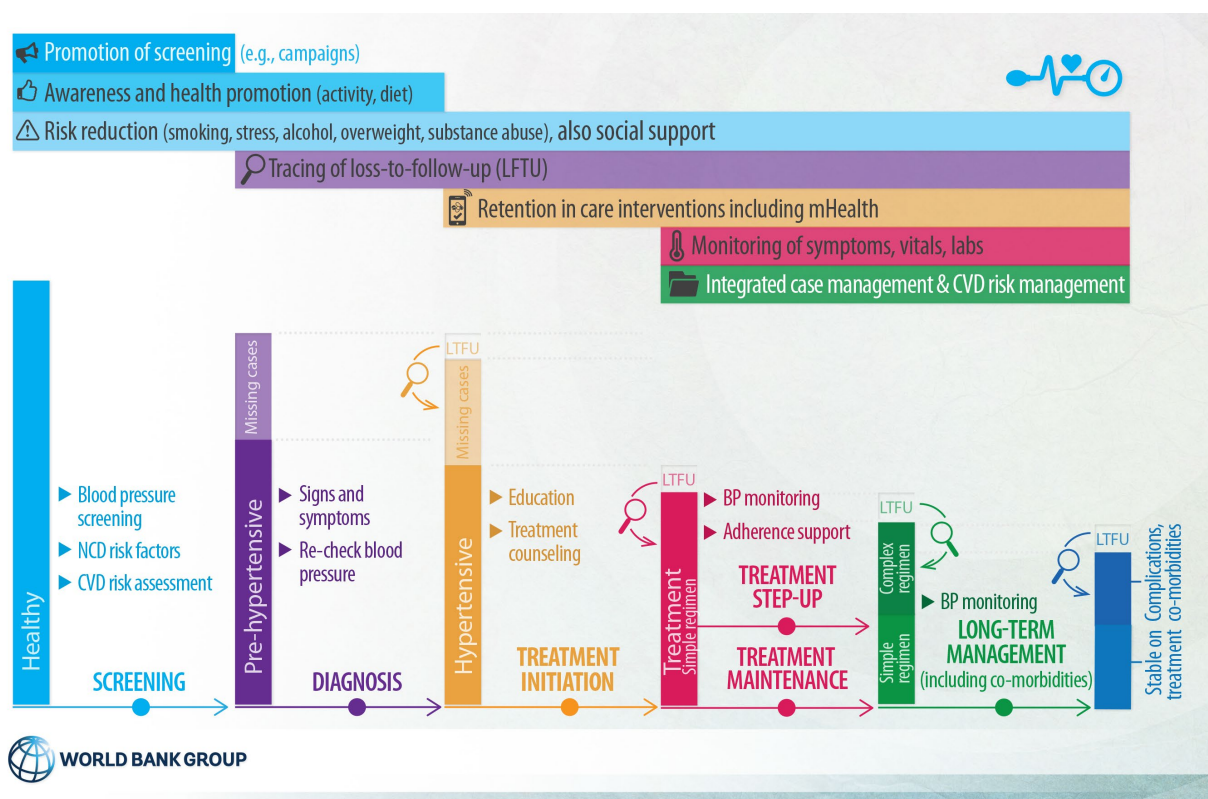
Perhaps partly because HTN is often asymptomatic, there are a number of challenges related to medication adherence for management of the condition in terms of patient initiation of treatment as prescribed, patient implementation of treatment as prescribed over time, and patient continuation of treatment (Vrijens et al. 2017). The magnitude of this problem was highlighted in a longitudinal study based on dosing histories compiled by an electronic medication event monitor in Switzerland, which showed that about half of the patients stopped taking prescribed antihypertensive medication within one year of starting treatment (Vrijens et al. 2008). Treatment should be coupled with education and knowledge provision, for both the caregiver and patient, about the necessity of medication adherence in achieving and maintaining control of HTN as well as a healthy lifestyle to ensure that treatment targets are reached and maintained (Jeemon et al. 2017). It is essential for patients to understand the need for ongoing control efforts that may last for the duration of their lifetime. Some efforts are specific to the need for medication adherence and patient support strategies. For instance, reduction of cost for medical care and medications has been linked with HTN medication adherence and control (Maimaris et al. 2013). Having a routine physician or place of care for HTN treatment has also been linked to adherence to treatment.

The attainment of BP control has important benefits for prevention of a variety of diseases and is seen as cost-effective across the globe (Gaziano et al. 2017). Due to variability and prevalence of high BP or HTN, one ideal targeting model for all health systems does not exist. Based on a country's HTN burden and risk factors within the population, the country can tailor an appropriate targeting strategy to meet its specific needs in the context of available resources. Some guidelines recommend a minimum of one opportunistic screening per adult per year (Jeemon et al. 2017), while the U.S. Preventive Services Task Force recommends targeting screening once per year for adults ages 40 years and older as well as for those who have increased risk for high BP and once every 3–5 years in adults who do not have increased risk for high BP (Siu 2015). Opportunistic screenings occur as part of routine medical care (usually through a PHC provider) rather than through a targeted prevention program.

BP screening can be done alone or as part of a comprehensive CVD screening program, and in fact, BP screens are increasingly accompanied by a CVD risk assessment. Current data indicate that it is more cost-effective to assess for overall CVD risk rather than screen for just BP or cholesterol levels, which can be done as part of an integrated program to reduce total cardiovascular risk (Gaziano et al. 2017). Screening for CVD can occur at the community or PHC level, and there is growing research around the globe to show similar effectiveness of CHWs conducting routine screenings when compared to the effectiveness by doctors and nurses at the primary care level. The caveat for this type of screening, however, is that referral diagnostic services and appropriate care should then be accessible and available for those who screen positive (Gaziano et al. 2017).

Cost-effective pharmacological treatments can also be tailored to CVD risk. For instance, depending on the resources available in a particular health system, it may be more cost-effective to treat those with very high CVD risk with multiple or more expensive drugs and to treat low-risk CVD patients with less expensive drugs. There are a number of pharmacological treatments available for the treatment of HTN, with no significant difference in efficacy between medications, although some classes of drugs may be more appropriate for certain patients due to other risk factors or conditions (WHO 2007). Once patients are on treatment, some countries have found the use of CHWs to be cost-efficient in assisting with medication adherence (Gaziano et al. 2017). Depending on available resources for particular health systems, treatment protocol and pharmacological guidelines can be adopted to address the need for HTN screening and treatment as well as establish the most cost-effective programs given their contextual feasibility. Successful HTN treatment can have a substantial impact on reducing the disease burden in a health system, given the large role elevated BP plays in multiple leading diseases.

Figure 2.2: Overview of different services across the continuum of care for HTN



# Diabetes

## Overview

In contrast to the decline of mortality rates attributable to a number of NCDs around the globe, diabetes mellitus, a condition marked by elevated blood glucose levels, has been growing in terms of prevalence and mortality worldwide (Ali et al. 2017). Global prevalence estimates showed diabetes to be 8.8% among adults in 2017, and the majority, an estimated 79% of those with diabetes, live in LMICs (IDF 2017a). According to IDF (2017a), diabetes may have caused 4 million deaths in 2017, but diabetes-associated mortality and burden are thought to be underestimated (Ali et al. 2017). There are different types of diabetes, for example, type 1, type 2, and gestational, each with its own trends over time, and their causes are entirely different. Type 1 diabetes, or juvenile onset, typically begins in childhood as an autoimmune disease that leads to a lack of insulin production. Type 2 diabetes accounts for over 90% of all diabetes cases and refers to insulin resistance and deficiency. Associated risk factors for type 2 diabetes include family history, overweight, an unhealthy diet, physical inactivity, older age, high BP, ethnicity, impaired glucose tolerance (IGT), history of gestational diabetes, and poor nutrition during pregnancy (IDF 2017a).

Diabetes is associated with a number of other serious health risks, including CVD, kidney disease, nerve disease, eye disease, pregnancy complications, and oral complications (IDF 2017b). One of the most concerning aspects of diabetes is the high diagnosis gap, with an estimated 50% of people with diabetes undiagnosed (IDF 2017c). There are similar estimates for undiagnosed individuals considered to be prediabetic who are considered at high risk for the development of diabetes (Ali et al. 2017). On top of the health impact, diabetes also has a considerable financial cost at an estimated 12% of total health spending around the globe in 2017 (IDF 2017b) and an estimated health expenditure of US\$727 billion. The combination of health and financial impact leaves important implications for health practitioners and policy makers for implementing appropriate early detection and effective treatment interventions.

Glucose control of patients with diabetes is therefore of great importance. Evidence shows that adherence to diabetes treatment varies by type of treatment (McGovern et al. 2018) and many other patient- and provider-related factors. Although underlying causes of the types of diabetes differ, each type affects the ability of the pancreas to either produce or use insulin, creating raised glucose levels, or hyperglycemia. The aim of diabetes treatment is to reduce glucose levels, with a general target for glucose control of type 2 diabetes at less than 7% (IDF 2017c). If glucose levels remain high over time, it can lead to damage to large and small blood vessels and other serious medical complications and conditions. The ability to reach glucose control is linked to access to routine care and medications, which are often challenging in LMICs (Ali et al. 2017). In addition, LMICs in general have a large number of undiagnosed cases. While there may be a variety of reasons at play, both of these challenges need urgent redressing to avert large costs and human suffering due to undetected, untreated, and poorly controlled diabetes.

## Screening/prevention

With the high level of undiagnosed cases globally, appropriate screening and prevention methods are of key importance. Screening for diabetes typically relies on simple and reliable glucose testing, and if screened appropriately, it is possible to detect a patient who is in a prediabetes phase before reaching criteria for a diabetes diagnosis. Many health systems also rely on initial screening through a locally validated screening questionnaire since they cover the main risk factors and can be administered through trained lay personnel, but this type of screening may not be feasible in contexts that lack access to a validated tool and/or trained personnel to administer the tool (McGovern et al. 2018).

Screening for diabetes should take place in the context of a comprehensive service offer that includes adequate resources and capabilities for full diagnosis of the suspect case and effective treatment of those diagnosed with diabetes. In a diabetes screening program, it is important that screening data are recorded in patients' medical records and that rescreening is conducted at the correct frequency as per clinical guidelines to ensure that incident cases are detected early. Diabetes screening is generally integrated in PHC visits of older adults with risk factors, but also in antenatal care services to identify women with

gestational diabetes. Once a patient is diagnosed with diabetes, further monitoring is also essential for the prevention of future health complications (Ali et al. 2017). Global evidence points to the need for ongoing medical checks for diabetes-related morbidity and organ damage, such as eye and foot problems (Ali et al. 2017).

#### Targeting of case finding and cost-effectiveness considerations

Screening programs are generally more cost-effective when focused on targeting those at highest risk for diabetes, including those over the age of 45 and those with other identified risk factors (that is, family history of diabetes, high BMI, HTN). International guidelines recommend that screening be administered opportunistically during routine health visits at least every three years and at least once per year for those considered at high risk (McGovern et al. 2018).

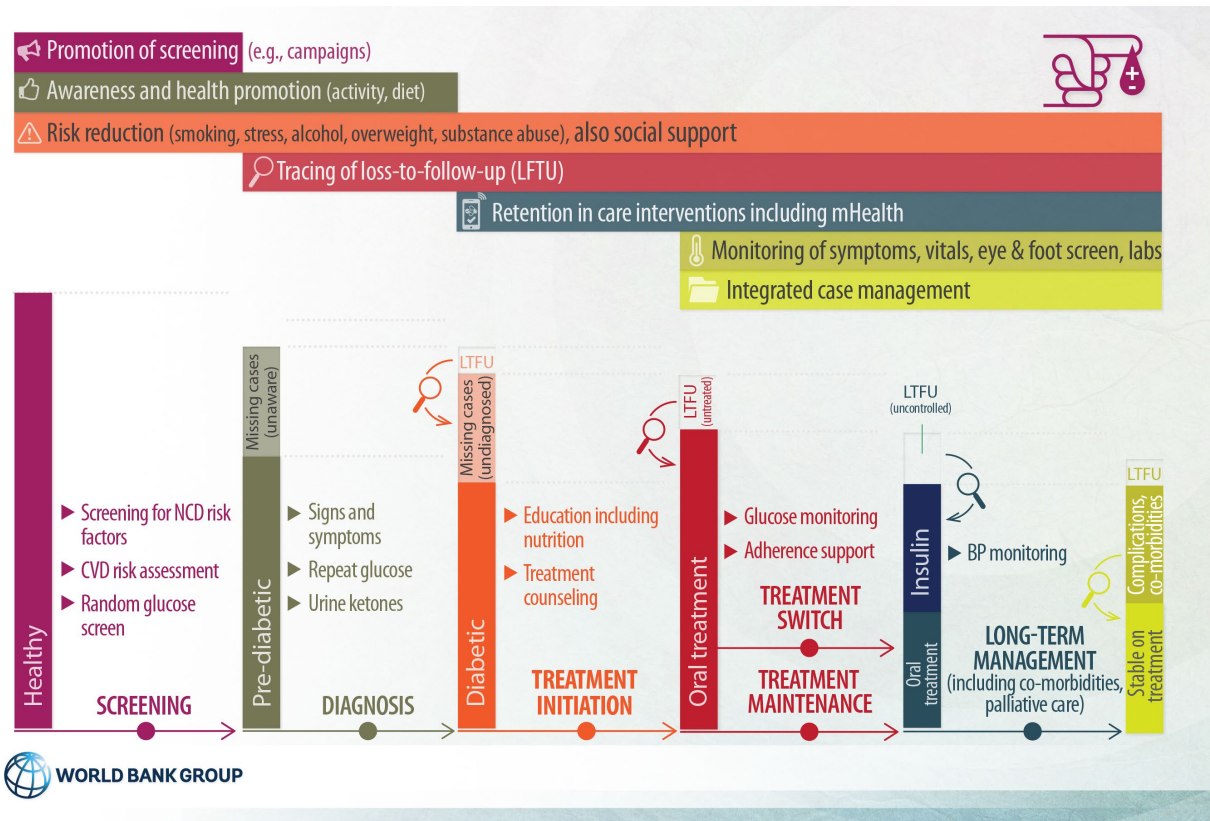
Although there is no consensus on the long-term gain and cost-effectiveness of screening for diabetes, global evidence points to many benefits of early detection, including the ability to implement lifestyle and potentially pharmacological interventions at the hyperglycemia (prediabetes) stage that can avoid or slow disease progression (Ali et al. 2017; McGovern et al. 2018). There are a number of specific, cost-effective interventions for a comprehensive screening, treatment, and management strategy for diabetes in LMICs. A screening approach identifying diabetes and prediabetes has been found to be a global best practice as individuals with early signs of possible diabetes can be earmarked for follow-up and rescreening at shorter intervals. Also, preventive interventions such as diet restrictions and increased physical activity can already take place at the prediabetic phase, and these are cost-effective (Ali et al. 2017). Screening programs that target the general population for diabetes are costly. A more cost-effective approach is a screening program that targets adult age groups with elevated diabetes incidence and individuals with other identified risk factors. A two-stage screening approach recommended by both the American Diabetes Association and the National Institute for Health and Care excellence includes the identification of risk factors in asymptomatic patients by asking about risk factors (including weight, family history, physical activity, and BP) and follow-up with blood testing (Ali et al. 2017).

Global evidence has linked access to health services and medication as barriers to good diabetes outcomes (Ong et al. 2018). Upon a positive glucose screen, patients rely on a sequence of services to attain good diabetes outcomes. Some recommended interventions include BP control, care management, self-management education, lifestyle interventions, glycemic control, lipid-lowering medications, smoking cessation, and foot care (Ali et al. 2017). Efforts to promote medication adherence are needed, and although more research is needed on specific medication-related interventions, financial capacity of patients is one of the main barriers affecting diabetes care. Financial barriers have been shown to affect control and adherence outcomes, while the reduction of OOP payments has been shown to improve outcomes (Ong et al. 2018).

As iterated above, a screening program also depends on capacity for medical interventions to address the problem and be cost-effective. Management of diabetes can be delivered effectively through a working PHC system, but this relies on the resources in local facilities and staff for consistent medication disbursement, knowledge and availability of equipment, and coordination of care (Ali et al. 2018; World Bank 2018a). Global evidence suggests the benefit of the use of integrated care models, the use of nonphysician health providers such as nurses and pharmacists, and the implementation of education programs for patients and care providers to improve diabetes outcomes (Ong et al. 2018).



Figure 2.3: Type 2 diabetes care cascade



## Breast Cancer

### Overview

BC is the most common and most likely cancer to cause death in women worldwide. While HICs have made progress to improve BC mortality through early screening and treatment methods, LMICs have seen an increase in BC mortality, much of which is thought to be attributable to late diagnosis and lack of effective treatment (Anderson et al. 2017a). Risk factors related to BC include age, genetics, and lifestyle factors, but the majority of evidence on decreasing related mortality is directly linked to early detection and treatment (Anderson et al. 2017a). An effective program for early diagnosis should include efforts to increase breast health awareness through education, reduce barriers to accessing care, conduct clinical breast examination (CBE), provide timely diagnosis, and implement a screening program when appropriate (Anderson et al. 2017b).

Figure 2.4: Global lessons on successful screening and early detection of BC (taken from Breast Cancer in Ukraine: The Continuum of Care and Implications for Action)

### **STRATEGIC MIX OF EARLY DETECTION METHODS**

- ▶ Mammography, CBE, breast self-examination (BSE), and other screening and investigative methods (such as 3D-mammography, tomosynthesis, ultrasound, MRI)
- ▶ Chosen method must be based on clients' profile, on-the-ground capacity, and local resources

### **TARGET GROUPS FOR MAMMOGRAPHY**

- ▶ Should consider BC demographics (many European programs have chosen the starting age of mammography screening at 45–47 years)
- ▶ Premenopausal women have a higher rate of false positives with mammography (digital mammography or tomosynthesis is a preferred option).
- ▶ Should consider an enhanced screening strategy for women with known inherited susceptibility (possibly using MRI mammography)

### **EFFECTIVENESS OF MAMMOGRAPHY SCREENING**

- ▶ Lower in younger women—19% reduction of BC in women ages 40–49 (evidence inconsistent) and 25% in women ages 50–69
- ▶ 'Number needed to screen' to prevent one BC death is highest in women ages less than 50 years (~1,900) and lowest at 60–69 years (~380)

### **QUALITY OF THE SCREENING PROGRAM**

- ▶ Impact reduced if mammograms are of inferior quality, and if those reading mammograms are not adequately trained and assessed ongoingly
- ▶ Requires screening registers and invitation/recall system

*Sources:* Anderson et al. 2008; ARC 2008; Gelband et al. 2015 (DCP3); Nelson et al. 2009.

*Note:* MRI = Magnetic resonance imaging.

## Screening/prevention

Early cancer detection and treatment are seen as highly linked systems that depend on both mechanisms to be working and available to improve outcomes (Anderson et al. 2017a). Both early diagnosis of BC and screening initiatives are important for an effective early detection program and may lead to an increase in successful treatment since interventions are more effective in earlier stages of the cancer (Anderson et al. 2017b). Many global screening initiatives for BC have taken place in HICs, and there remains a great need to build the available knowledge on what works for reducing the burden of BC in lower-resource contexts. Nevertheless, experiences of effective BC programs still hold relevant lessons for health systems seeking to develop strategies.

In LMICs, detection of BC often occurs at a later, more advanced stage. To address this problem, health systems can focus on using screening to 'stage shift' or detect cancer at an earlier stage (Anderson et al. 2017a). Evidence-based screening methodologies include (a) mammography, which uses low-dose x-rays to detect cancer; (b) CBE, a physical examination conducted by a health care provider; and (c) BSE, in which a woman regularly examines her own breasts to detect any changes or growths that need further clinical evaluation. Mammography screening is the most effective screening tool but is also most expensive and relies on availability of highly trained staff and modern equipment. While CBE has mostly been studied only in HICs, it is less expensive than mammography and can be administered by health workers (Anderson et al. 2017a). Although it is cost-effective and relatively simple, CBE as a stand-alone screening modality has not been adequately studied for its impact on BC survival and therefore is better seen as a component of routine breast health care that can promote detection (Anderson et al. 2017b), or integrated in well woman programs providing preventive health screening services to women. BSE is a model that allows women to self-identify and act as the initial screener for potentially cancerous breast tissue, but the use of BSE as a formal screening methodology is also controversial since evidence has shown that it leads to an increase in further testing but not necessarily in the reduction of BC mortality (Anderson et al. 2017b). Although it is a relatively simple strategy, BSE relies on some kind of standardized breast awareness

education program and requires further screening as well as capacity for diagnosis and treatment (Anderson et al. 2017a). Globally, many have argued that a mix of methodologies can be most effective as it would allow for consideration of a particular patient as well as local resources for screening and treatment.

In following global guidance, before a nation develops any BC control program, an assessment should be conducted on the magnitude of the BC problem in the population, the existing infrastructure in place, and cultural issues that may affect a woman's participation in a screening program (Anderson et al. 2017a). In countries with a weak database or lack of accurate cancer registry for such an assessment, death records and hospital records can be used to estimate BC deaths and case numbers (Anderson et al. 2017a).

#### Targeting of case finding and cost-effectiveness considerations

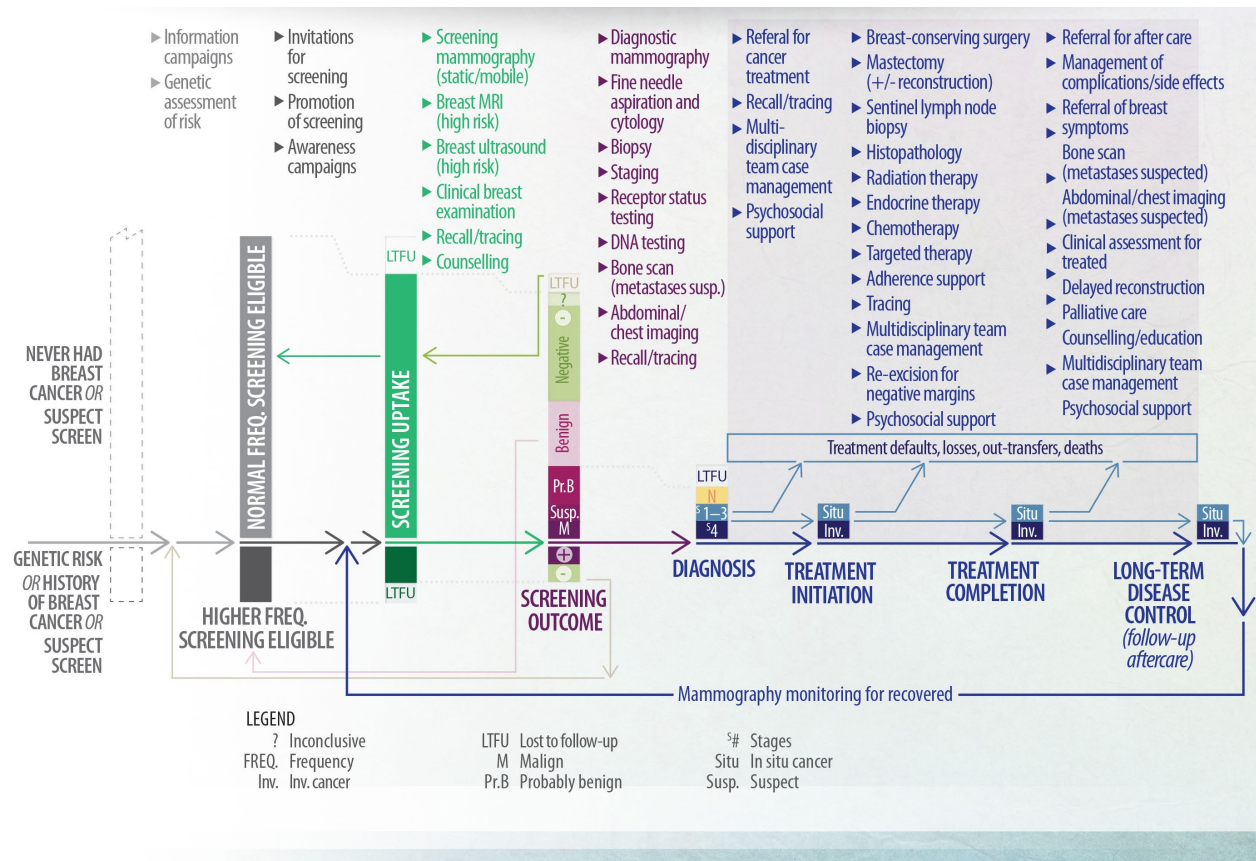
Discrepancy exists between guidelines for recommendations of targeting and methodology for BC screening. While the USPSTF does not recommend routine screening with CBE due to lack of evidence of effectiveness, other organizations such as the American Cancer Society and American College of Obstetricians and Gynecologists recommend the use of CBE for screening for women ages 20–40 every 1–3 years and the combination of CBE and mammography for women over the age of 40 every year (Bryan and Snyder 2013).

Targeting for BC screening is mostly related to a woman's age, and health systems should consider their own demographics when setting up specific age-related target groups for screening. Health systems should also consider the rates of false-positive screens when choosing a screening strategy, as false positives can create large diagnostic costs and unnecessary trauma in the individual patient. For instance, wide age groups in screening can increase the rate of false-positive screens and generally increase cost due to the screening-eligible population. In addition, there is global evidence to point to the effectiveness of different types of screening methods for different age groups of women as well as screening strategies based on a particular patient's other known risk factors including familial risk. Global evidence suggests that universal mammography screening is not considered cost-effective in lower-resources settings (Anderson et al., 2017a). In such settings, mammography screening should therefore be targeted to higher-risk women (especially those with familial risk or a history of BC). In order to undertake targeted breast cancer screening, countries might consider selective and strategic purchasing of these services from the private sector for the highest risk women. In better resourced health systems, the trend has been toward universal screening of women from a certain age. To run mammography screening programs efficiently, an automatic invitation and recall system, as well as a referral system for further investigations, is important. Therefore, resource-limited countries might prefer CBE to facilitate early detection of BC in the targeted population while at the same time working toward an increased capacity for BC diagnosis and treatment (Anderson et al. 2017b).

Resource-limited health systems can rely on existing guidelines, for instance, the Breast Health Global Initiative and WHO guidelines, to assess current capacities and strategies for cost-effective early detection and treatment options for BC. By analyzing different approaches, an individual country can tailor early detection, screening, and targeting guidelines that are most relevant and cost-effective based on its context and scope of BC problem. Increasing population awareness of breast health can be a feasible way to promote early detection of BC and the importance of seeking professional medical care as soon as breast abnormalities become apparent. Public education and awareness programs can focus on teaching about early detection, BC risk factors, and breast health awareness, including BSE (Anderson et al. 2017a). In general, resource-limited countries should focus on building capacity through breast health awareness and provide training before a formal mammography screening program is adopted (Anderson et al. 2017b). Research from many LMICs has shown that reliance on the less-expensive CBE methodology, particularly in countries without an existing screening program, is cost-effective and will likely detect the majority of prevalent cancers, slowing the rise in the BC mortality (Anderson et al. 2017a). However, unlike mammography screening programs, there is no evidence yet that shows the use of CBE as actually lowering BC mortality. CBE is still seen as a valuable tool, and because the use of CBE as a formal screening tool may be the most viable option in low-resource settings, efforts should be made toward

education to increase the quality of examinations as well as toward evaluation mechanisms to test the effectiveness of CBE. Where possible, the combination of CBE, mammography, and BSE would be prudent.

Figure 2.5: Overview of different services across the continuity of care for BC



## Cervical Cancer

### Overview

CC is one of the most common cancers in women in LMICs. Countries around the world have been able to drastically reduce CC-related mortality through cytology-based screening programs, but the programs are typically expensive and dependent on a number of established health care resources. Because of this, cytology-based screening programs generally face increased barriers to sustainability and success in LMICs (Denny et al. 2017). CC incidence affects poorer nations and poorer populations within countries disproportionately. LMICs continue to bear the majority of the burden of cases and deaths related to CC (Denny et al. 2017), with an estimated 85% of CCs occurring in LMICs (Jeronimo et al. 2017). Due to its nature, cultural issues and beliefs related to sexual behavior are important considerations when assessing screening and treatment options for a particular context (Denny et al. 2017).

Figure 2.6: Global lessons on CC screening (taken from Cervical Cancer in Ukraine: The Continuum of Care and Implications for Action)

Success of a screening program in decreasing cervical cancer incidence and mortality is largely a function of the following:

- ▶ **Coverage** of screening of women at risk
  - 1–3 screens for all in a lifetime for a larger number of women more important than frequent screening with low effective coverage for the same small cohort of women cohort
- ▶ **Target age** of women screened
  - For example, 30–65 years, as low yield <30 years due to slow cancer growth
- ▶ **Follow-up** of positively screened women
  - Approaches requiring fewer patient contacts (1–2) better than approaches requiring multiple patient visits
  - Screen-and-treat models promising in middle-income countries
- ▶ **Reliability** of cytology services
  - Moderate sensitivity (44–78%), high specificity (91–96%)
  - Stringent training and quality control required

### Screening/prevention

When detected early, CC is treatable. The later the cancer is detected, however, treatments tend to be more intense and more expensive and have lower cure rates. Traditionally based on cytology screening methods, there are now a number of different CC screening methods that can be effectively used in different health systems, including screening with visual inspection with acetic acid (VIA) and human papillomavirus (HPV) deoxyribonucleic acid (DNA) testing (Denny et al. 2017). Cytology testing in the form of the Papanicolaou test (Pap test) is administered through a procedure that collects cells from the cervix that can be used to detect cancer and pre-cancer. The Pap test has been the test of choice, particularly in western countries, and is reliant on the availability of laboratories and trained personnel to examine the sample cells (American Cancer Society 2016). Screening with VIA is a quick, simple, and inexpensive method in which a health care provider uses a swab of acid on the cervix to detect changes in tissue. Due to its advantages of low cost and fast diagnosis, it is often the best option in low-resource settings that have limited capacity for the other types of screenings. Because CC is highly linked to an individual's persistent cervical infection of certain types of HPV infection, screening for HPV by testing for HPV DNA in cervical cells is a common method. Some guidelines recommend HPV testing for all health systems, while others recommend the use of HPV only as an additional test to the Pap test. Each screening method comes with its own set of benefits and challenges that health systems must consider when putting together a screening program, including variances in reliability depending on the age and condition of a woman being tested.

### Targeting of case finding and cost-effectiveness considerations

Screening programs for CC have been shown to be cost-effective (Denny et al. 2017). The most important criterion for targeting of CC screening is age. Global evidence has shown that creating guidelines around the target age range of a screening program and achieving coverage of screening in that age bracket are of key importance (Denny et al. 2017). Evidence suggests that a total of 1–3 screenings during every woman's adult life, starting after the age of 35, is much more efficient than numerous screenings for a subset of women. Therefore, the effectiveness of a cervical screening program is a function of age targeting and coverage. In addition to the age of a woman and the frequency of screening, the value of a CC screening program will also largely depend on the quality and reliability of the screen and the ability of a health system to provide follow-up testing and treatment while avoiding a high number of loss to follow-up patients (Denny et al. 2017; World Bank 2018b).

Since women living with HIV have a higher risk of invasive cervical cancer (reflecting both immunosuppression caused by HIV infection and shared risk factors), health systems have also integrated cervical cancer screening services into HIV services (Sigfrid L, et al 2017). This often includes the treatment

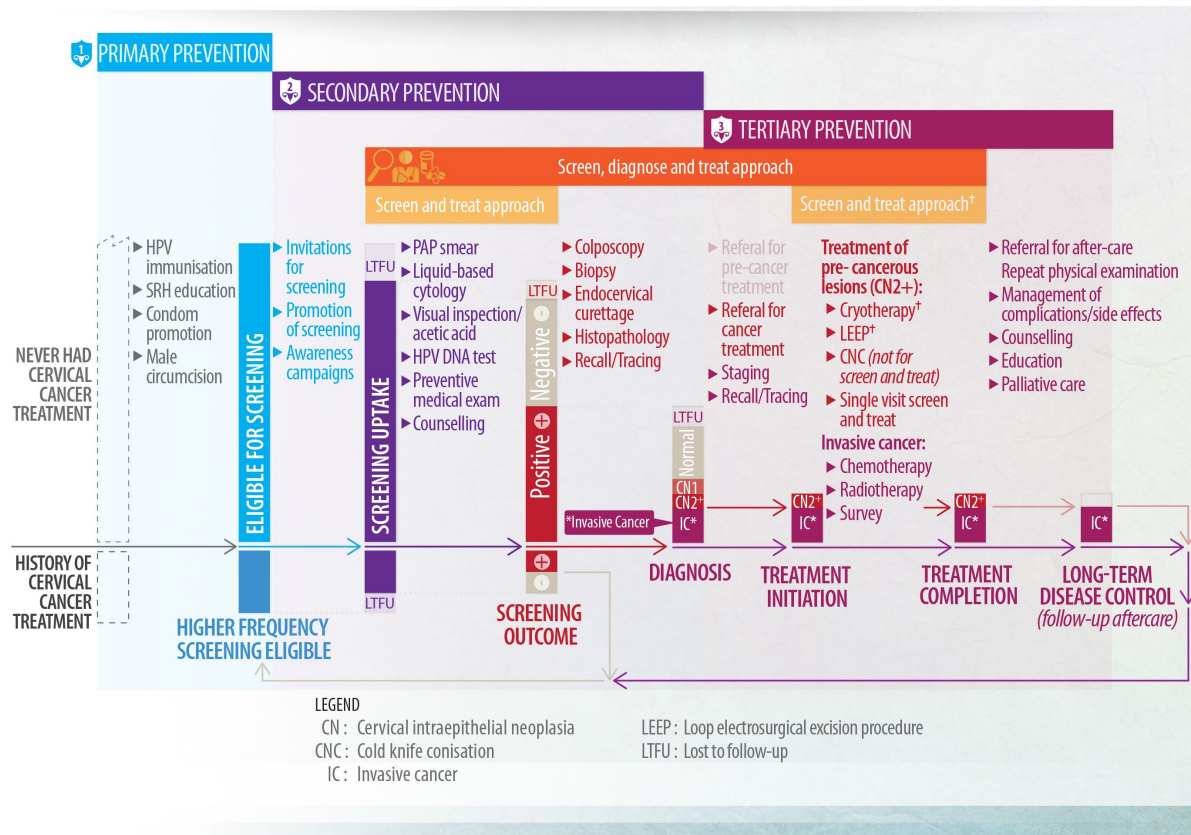
of cervical cell lesions in a 'screen-and-treat' approach within the same visit. Nevertheless, high loss to follow up for further treatment remains a challenge in these integrated service models as well. The screening method of relevance for a particular context will largely depend on the resource setting, and there are a number of helpful guidelines for health systems to use when tailoring their own screening program for CC. The American Society of Clinical Oncology recommends HPV DNA testing in all resource settings, with different time intervals between testing depending on local resource capacities, and cytology as a follow-up test in settings that have the capacity for cytological testing (Jeronimo et al. 2017). The American Cancer Society recommends cytological screening every three years starting at age 21. After the age of 30, American Cancer Society recommends a combination of cytological and HPV testing every five years or continuing cytological testing as a stand-alone test every three years (American Cancer Society 2018). The WHO also has a set of guidelines for health systems to make decisions on which tests and at what intervals to use for CC screening, taking into account a healthy system's particular resources in terms of finances, infrastructure, and current screening capabilities. The WHO recommends screening prioritization for women between the ages of 30 and 49 and supports the importance of coverage, with even one screening test in a woman's lifetime as beneficial (WHO 2013).

In addition to screening, HPV vaccination as a primary prevention strategy against CC has been shown to be highly effective and cost-effective, demonstrating protection from two types of HPV that make up about 70% of CCs around the globe (Denny et al. 2017). Most research on vaccination programs for addressing CC has shown a substantial reduction in CC morbidity and mortality (Denny et al. 2017). Particularly in areas where resources are scarce, the authors recommend that countries with unsustainable cytology programs can consider HPV vaccination programs and/or the use of alternative screening methods for CC control. In terms of creating such a vaccination program, cost is a major concern, and although potentially leading to future cost saving, a country will have to assess whether a vaccination program for young women is affordable. In addition, capacity is required in the health system to provide a vaccination program to preadolescent girls. There is a growing trend, particularly in HICs, to pair HPV vaccination programs with screening programs for non-vaccinated females to further improve CC prevention.

To complement screening and prevention programs for CC, countries may also want to assess for cost-effectiveness of population-based education programs to target cultural issues that can affect sexual health and behavior. For instance, there may be specific cultural or religious norms that affect appropriate sexual behavior, including behaviors affecting the spread of HPV, as well as a woman's willingness to seek and receive treatment.

A strong HPV vaccination program and high CC screening coverage are both required to tackle CC effectively. The case of Australia shows that if these two strategies are maintained at their current rates, cervical cancer is likely to be eliminated as a public health issue in Australia by 2035 (Hall MT, Simms, KT, Lew JB et al. 2019). The case of Rwanda shows that high levels of HPV vaccinations can be achieved in LMICs, with Rwanda being the first to reach universal HPV coverage in the program's target group of 12-year-old girls (Sayinzoga et al 2020). For HPV vaccination programs of national scale, it is critical to determine the most cost-effective ways to deliver these services (e. g. facility based, school based) as the largest element of cost is the actual service provision.

Figure 2.7: Overview of different services across the continuity of care for CC



## Chapter 3: Cascade Methodology

At the request of the regional teams, the World Bank has conducted a comprehensive analysis of NCD care through the application of the NCD cascade analysis. The analysis is an innovative approach to assess the continuum of care for specific disease priorities. With a focus on supporting health care monitoring and evaluation, the NCD cascade focus area was initiated to strengthen public health development in Ukraine

The cascade methodology is a measurement tool that characterizes the steps of engagement involved in linking people to programs or services and then identifies bottlenecks or choke points in the system. A cascade methodology looks at each stage or step in service delivery and identifies where improvements can be made. The NCD cascade analysis has been implemented with four diseases in two regions of Ukraine (Lviv and Poltava): HTN, diabetes, BC, and CC. The cascade model was used to analyze diagnosis, link to care, treatment adherence, and disease control. In each stage, bottlenecks, or places where the system slows down, fails, or stops, were identified. Then, these bottlenecks were used to identify solutions to make the system more effective and efficient.

The World Bank team analyzed all available data on the four diseases and prepared comprehensive findings of the cascade analyses. The results of the analysis are being used to critically review identified existing gaps in service delivery and to reorient programs and improve outcomes. As a result of the analytical work, presentations of key findings and existing challenges for the four NCDs were created. The World Bank team provided policy briefs for each of the diseases to clearly describe key findings (main breakpoints that prevent NCD care from being effective) and recommendations for action.

Figure 3.1: Service delivery cascade



During the cascade analysis conducted in Lviv and Poltava, for HTN and diabetes, we looked at the patient continuum of care and asked four questions about the patient's health journey. The answers to those questions served as the structure of the cascade:

- Among those with the condition, what is the diagnosis gap?
- Are disease cases (that is, HTN, type 2 diabetes) linked to care and started on treatment as per norm?



- Are they monitored as they should be?
- Do they achieve the treatment target (BP or glucose control)?

Failure at any stage of the cascade precludes success at the next, which means failures are compounded from tier to tier.

Different sources of information were used to find answers to methodological questions: demographic passport data, local disease prevalence estimates, screening campaign reports, Health Index Survey, ambulatory patients' cards (survey), qualitative research on the perspectives of health care clients and community members, and annual statistics form #12.

For HTN ambulatory patients' cards (survey), we used a sample of 777 patient cards in the Lviv and Poltava regions, which were randomly selected from 11 health facilities. For diabetes, this type of survey was only conducted in Poltava and used a sample of 400 patients, randomly selected from five health facilities.

The cascade analysis for CC and BC was conducted with logic and based on the sequence of the continuum of care that patients went through. Answers to the following questions provided data for the cascade:

- What is the size of the target group for cancer screening?
- Who is screened, and how often?
- What is the screening gap?
- Are positive screens linked to follow-up investigations?
- At what stage are the cancers diagnosed?
- Are cases treated, and how quickly?
- Is treatment completion and long-term monitoring information available to the Oncology Teams?

For cancer cascade analyses, we used next sources of data: demographic passport data, Health Index Survey, ambulatory care form 025 (survey), qualitative research, national cancer bulletins, cancer registry C50, and C53 (data extracted, coded, and analyzed of the first episode) cytology laboratory data.

## Chapter 4: Hypertension Care in Ukraine: Breakpoints and Implications for Action

**HTN is one of the leading causes of preventable mortality in Ukraine.** While CVDs cause 65% of deaths, high systolic BP was responsible for 42% of total deaths in 2016,<sup>10</sup> and this rate is the highest in the world (compared to 15% in France, 23% in China, and 41% in Bulgaria, which is the second highest).

According to the Health Index Survey 2017,<sup>11</sup> people pay attention to their BP measurements, and 78% of the population reported measuring their BP in the past 12 months. About one-third of Ukrainian adults (34%) have HTN, but only about 40% of people with HTN achieve normal BP levels when receiving treatment. Behavioral and metabolic risk factors are the most common reasons for the development of HTN in adults (IHME 2017c).

### Key Messages

1. The cascade analysis was conducted to systematically identify the breakpoints along the HTN care delivery chain in Lviv and Poltava regions. The continuum of HTN care included diagnosis, treatment initiation, BP monitoring according to the norm, and the attainment of BP control while on treatment.
2. The analysis found significant gaps in detection, treatment monitoring, and treatment adherence in the HTN program. The largest breakpoints were BP monitoring at the frequency recommended by the official guideline on HTN management (67% and 71% gap in compliance in Lviv and Poltava regions) and achieving normal BP while on treatment (76% and 65% gap among patients with BP monitoring data in Lviv and Poltava regions, respectively). Estimates of the BP screening gap were uncertain but probably larger in Poltava region.
3. This HTN cascade analysis in two regions presents important lessons and policy implications for HTN care in Ukraine: (a) HTN screening is only the first step in a **sequence of services** the health sector needs to ensure so that HTN patients achieve BP control; (b) closing the BP screening gap will help **detect HTN early** and link cases to effective treatment; (c) immediate HTN treatment and systematic follow-up should **focus on patients with stage 2 and 3 HTN** and those with **comorbidities** such as diabetes and obesity, to prevent poor outcomes; (d) low rates of **BP control** require additional attention and effort from care providers at all levels; (e) comprehensive record keeping of patient risk factors (smoking, BMI, comorbidities) and appropriate exchange of patient data between levels of care can be improved to support decision making; and (f) there is a need for the development of **systems for managing risk factors related to HTN** in Ukraine for primary prevention, earlier detection of HTN, and successful management of cases.
4. Treatment for BP control is cost-effective in all regions of the world, and in Ukraine improved HTN care **would save lives, reduce disability, and save resources in health care.**

### Background and Rationale

**In Ukraine, CVDs have been recognized as a leading burden of disease.** Several policy measures have been adopted in response, including reimbursement of drug costs for patients with HTN and establishment of reperfusion centers for acute heart surgery in 2017. In addition, there has been a significant increase in tobacco taxation over the last decade, considered to be linked to a 20% decrease in smoking rates. Such actions already show positive results in terms of reducing mortality rates among people with heart attacks

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<sup>10</sup> Data cited as referred to in World Bank. 2009; Ukraine DHS, 2007 - Final Report (English) (<https://dhsprogram.com/pubs/pdf/FR210/FR210.pdf>); IHME 2017c.

<sup>11</sup> Health Index Survey Report 2017. <http://health-index.com.ua/>.

(reduced death rates in people with acute myocardial infarction by 20% in 11 regions of Ukraine<sup>12</sup>) and lower numbers of emergency care calls after implementation of the reimbursable drugs program (a reduction of 4.2% in reported emergency cases for strokes and heart attacks<sup>13</sup>). In addition, an indicator of hospitalization rates measured in the SPIH Project in seven Ukraine regions has shown a 12% drop, from 5.95 hospitalizations per 1,000 population in 2015 to 5.32 in 2017.<sup>14</sup>

.....  
*In Ukraine, available data suggest that undiagnosed or uncontrolled HTN is one of the most frequent causes for hospitalization of patients, and uncontrolled HTN significantly contributes to mortality particularly in the population over 50 years of age.*  
.....

**A key recommendation in the HTN guideline<sup>15</sup> from the MoH is for Ukrainian primary care providers to detect HTN early through regular BP measurement of all adults with any identified risk factor (smoking, high cholesterol, excessive body weight, low physical activity, and alcohol overuse).** Patients with a systolic BP of 140 or above and diastolic BP of 90 and above should then be examined further to confirm the presence and stage of HTN. Once diagnosed, first- or second-line antihypertensive medication should be prescribed. Patients on treatment should monitor their BP level daily and receive additional monitoring through visits to a health care facility. Until the target level of BP is achieved, the patient should visit a physician every 2–3 weeks. For patients known to have high risk and poor treatment adherence behaviors, the interval of follow-up visits should be at least once in three months. Once BP normalizes, regular monitoring by the primary care provider is recommended every 6–12 months.

**Given the long-term monitoring and treatment needs of hypertensive individuals by primary care providers, HTN can be used as a tracer condition for assessments of chronic care and treatment adherence.** In Ukraine, available data suggest that undiagnosed or uncontrolled HTN is one of the most frequent causes for hospitalization of patients, and uncontrolled HTN significantly contributes to mortality particularly in the population over 50 years of age (strokes and ischemic heart diseases are responsible for an estimated 48% of deaths in adults ages 50–69<sup>16</sup>).

Using HTN as a tracer for chronic care, an analysis was conducted on the continuum of care for HTN in two regions in Ukraine, Lviv and Poltava. The aim was to assess breakpoints in the care cascade and consider priority setting for HTN control. The analysis also provided a 2016 baseline prior to the introduction of an HTN prevention, screening and health sector strengthening program in Poltava region. It took into account the newly issued recommendation from the MoH on HTN screening of February 2018.<sup>17</sup>

## Findings

**The cascade analysis showed that main breakpoints in HTN care are regular and risk-adjusted monitoring of BP levels among HTN patients, the achievement of BP targets, and the systematic**

<sup>12</sup> Interfax - Ukraine 2018. Cardio-surgeons for the first time in 10 years state reduction in death rate from heart attacks by 20% in 11 regions of Ukraine (Reported by the Association of interventional cardiologists of Ukraine based on data from the Registry of Percutaneous Interventions). <https://ua.interfax.com.ua/news/pharmacy/502054.html>.

<sup>13</sup> The MoH reported 17,000 less emergency calls associated with 'Dostupni Liky' (accessible drugs) program after one year of its implementation <http://moz.gov.ua/article/news/dostupni-liky-za-chas-roboti-programi-ukrainci-viklikali-shvidku-na-17-tisjach-raziv-menshe> Online dated 2018-05-25.

<sup>14</sup> A joint project between the World Bank and the MoH of Ukraine on improving health care at the service of people. <http://wb.moz.gov.ua/>.

<sup>15</sup> Unified Clinical Protocol of Primary, Emergency and Secondary Medical Care "Arterial HTN", 2012.

<sup>16</sup> Data from the Institute for Health Metrics and Evaluation GBD 2016 © 2018 University of Washington.

<sup>17</sup> Recommendations for disease screening and periodic examinations at the primary health care level developed by the MoH of Ukraine. <http://moz.gov.ua/article/for-medical-staff/rekomendacii-schodo-udoskonalennja-sistemi-profilaktiki-ta-rannogo-vijavlennja-zahvorjuvan> Online dated 2018-02-02.

**monitoring of key parameters in HTN such as body weight, glucose, and cholesterol levels.** The presentation of the major gaps in HTN control can be seen in Figure 4.1, which captures patient losses at all key stages of HTN care in two regions of Ukraine. The most problematic stages are compliance with

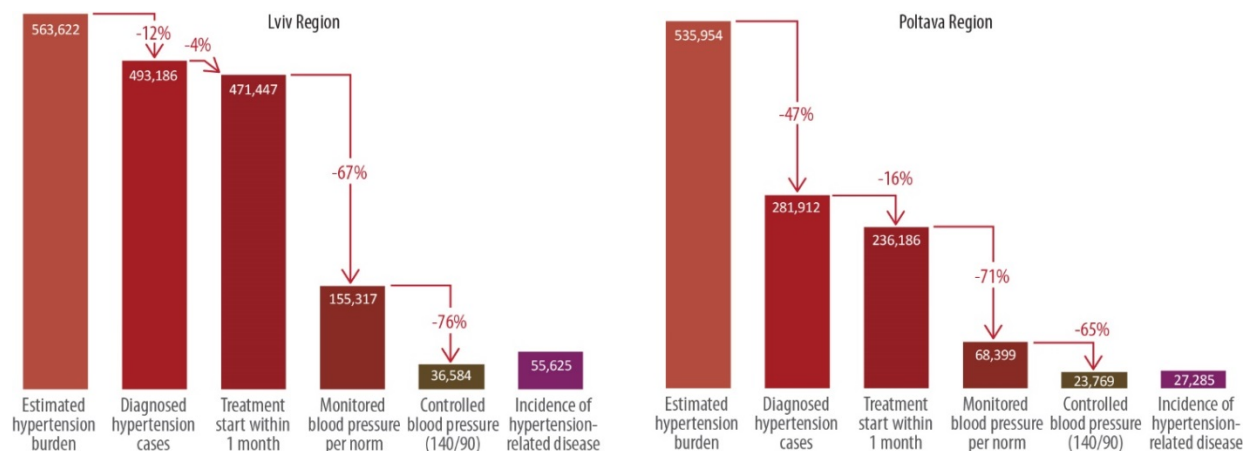
*The most problematic stages are compliance with HTN protocol guidelines for monitoring of patients with HTN, especially those patients with elevated BP while on treatment...and achieving normal BP while on treatment.*

HTN protocol guidelines for monitoring of patients with HTN, especially those patients with elevated BP while on treatment (67% and 71% gap in compliance in the Lviv and Poltava regions, respectively) and achieving normal BP while on treatment (76% and 65% gap even among patients complying with monitoring in Lviv and Poltava regions, respectively).

**At the time of analysis, there was no recent estimate of HTN prevalence in Ukraine.** The 2007 Ukrainian Demographic Health Survey (which measured BP of a sample of adults) reported that about 25% of women ages 15–49 and 32% of men ages 15–49 can be classified as hypertensive,<sup>18</sup> which, if extended to the total adult population, suggests at least one-third of the adult population is living with HTN. No representative survey with BP measurement has since been conducted. The estimates for HTN prevalence in the Lviv and Poltava regions as provided by local teams of experts varied, from 28% in the Lviv region and up to 45% of in the adult population in the Poltava region. Poltava region experts based on experiences and knowledge of local context confirmed a large gap between prevalent cases and diagnosed cases. The Health Index Surveys of 2017 and 2018 only collected self-reported data on BP measurement at clinics. In 2017, 82% (Lviv region) and 80% (Poltava region) of adults reported having measured their BP within the last 12 months. Among these, 21% (Lviv region) and 23% (Poltava) had elevated BP, according to the survey respondents. These estimates are similar to the prevalence of HTN based on medical records<sup>19</sup> with 24.3% of adult patients in the Lviv region and 23.7% of patients in the Poltava region

classified as hypertensive.

Figure 4.1: HTN care cascades for 2016 in Lviv and Poltava regions



Sources: Lviv and Poltava regional demographic statistics (target to screen), Health Index Report 2017 (questions related to BP), regional 2016 annual form #12 statistics, Lviv cardiology 2016 screening campaign report, patient form 025 extract, demographic statistics ambulatory care data from primary care units form 025 (BP screen, screening result, diabetes status, ABC (glucose, BP, LDL cholesterol) monitoring, and records of hospitalization)

<sup>18</sup> Ukraine DHS, 2007 - Final Report (English). <https://dhsprogram.com/pubs/pdf/FR210/FR210.pdf>.

<sup>19</sup> The sample of medical records used for the analysis included a randomized selection of medical cards in four primary health care centers in the Poltava region in November–December 2017 (total of 777 records) and four primary health care centers in the Lviv region in December 2017 (410 records). The inclusion criteria were that HTN confirmed latest in 2016 to understand follow-up and treatment success patterns.

**Time to treatment: As per guideline, most HTN patients are prescribed treatment on the day of HTN diagnosis, but some patients have a long delay until treatment is prescribed or initiated.** According to our analysis of routine medical records<sup>20</sup>, for 77% (Lviv region) and 79% (Poltava region) of diagnosed patients, treatment was initiated on the same day of HTN diagnosis and for an estimated 84–86%, treatment was initiated within the first month after diagnosis (Figure 4.1). There is a prolonged delay in starting treatment for those patients not initiating the same day. The median delay to treatment for these patients was six weeks in the Poltava sample and three months in the Lviv sample. Overall estimates showed that **one in eight patients diagnosed with stage 3 HTN were not on treatment after one month of diagnosis in the Poltava region, and one in six patients in the Lviv region.** The analysis did not have any data to assess the two substages within the screening-diagnosis continuum (from positive BP screen to HTN diagnosis), but it is likely that there are patients lost or incurring delays between these two substages.

Figure 4.2: Stage of HTN at diagnosis in Lviv and Poltava regions

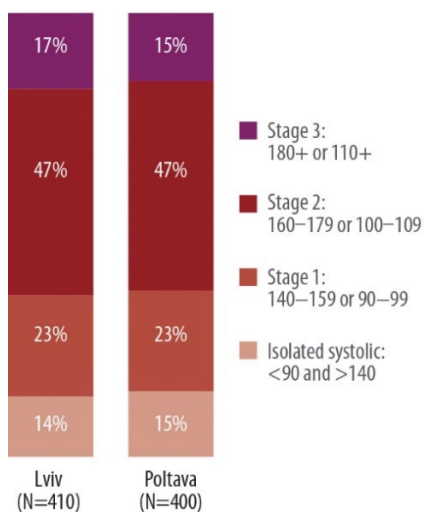
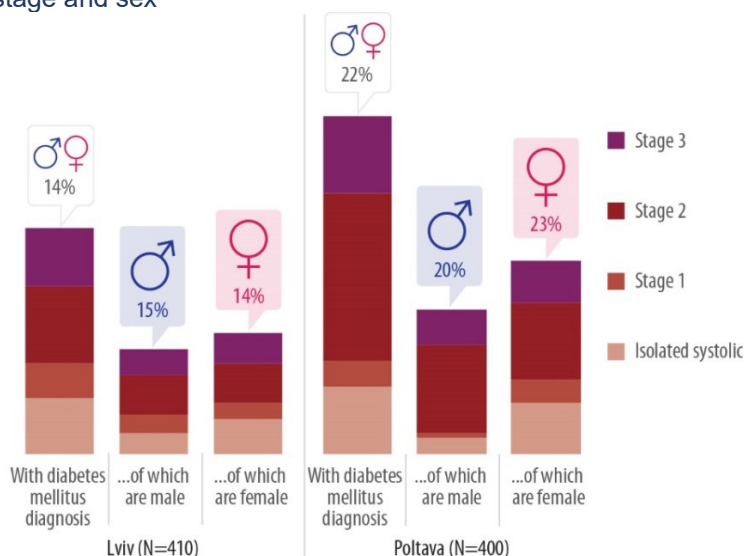


Figure 4.3: Prevalence of diabetes among HTN patients by stage and sex



Source: Analysis of samples of medical records extracted from ambulatory care cards (form 025) for Lviv and Poltava regions.

.....  
*There were 1.6 times more comorbid HTN/diabetes patients in the Poltava region compared to the Lviv region.*  
 .....

**Stages and comorbidity: Most patients are diagnosed in stage 2 or 3 of HTN, and often HTN diagnosis goes together with overweight and a diagnosis of diabetes mellitus.** Almost equal numbers of patients diagnosed with HTN are registered in stage 2 and 3 in the Lviv and Poltava regions (64 and 62%, respectively; see Figure 4.2). Patients who were overweight (BMI > 25) and obese (BMI > 30) made up the majority of patients diagnosed with stages 2 and 3 HTN, but there were gaps in data availability between regions: weight and height information was routinely recorded in the Poltava region, but less than half of the sampled patient records in the Lviv region ambulatories contained the data. Joint diagnoses of HTN and diabetes occurred frequently, but there were differences between regions; there were 1.6 times more comorbid HTN/diabetes patients in the Poltava region compared to the Lviv region, based on patient record data (see Figure 4.3).

<sup>20</sup> The sample of medical records used for the analysis included a randomized selection of medical cards in four primary health care centers in Poltava region in November-December 2017 (total of 777 records) and four primary health care centers in Lviv region in December 2017 (410 records). The inclusion criteria were that HTN confirmed latest in 2016 to understand follow up and treatment success patterns.

Roughly two-thirds (67 percent) of HTN patients in the sample were not seen by a primary care doctor in accordance with the recommended interval.

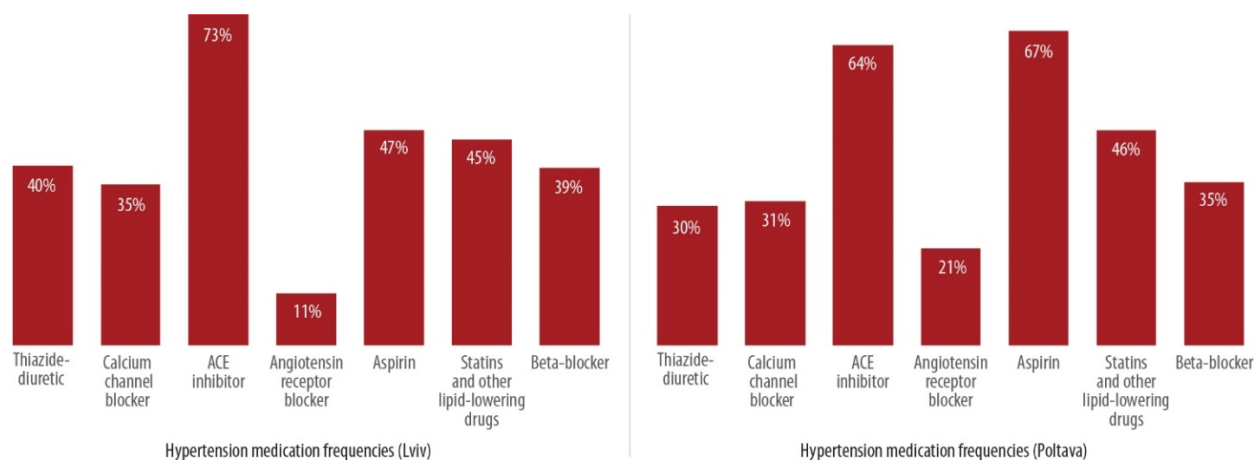
**Correct BP monitoring of patients on treatment is one of the largest breakpoints based on the frequency recommended by the ‘Arterial HTN’ guideline.** Roughly two-thirds (67%) of HTN patients in the sample were not seen by a primary care doctor in accordance with the recommended interval (within 3 weeks of a high BP measurement and within 6–12 months if the last BP measurement was within the normal range). Adherence to follow-up monitoring was much better for patients with a last follow-up BP in the normal range (92% compliance in the Poltava region and 89% in the Lviv region). HTN patients with elevated BP rarely returned for a follow-up BP measurement within 3 weeks (only 1 in 10 cases in the Poltava region and 2 in 10 cases in the Lviv region). Data showed that male patients and younger patients ages less than 35 years had especially long intervals between BP assessments after an elevated BP. In contrast, patients in older age groups and comorbid patients with diabetes had better follow-up monitoring at the health care provider level.

Predictors of higher numbers of drug types included older age, longer duration of disease, and being female.

**Treatment strategies (pharmaceutical): Based on patient file review, HTN patients were receiving medical prescriptions that are in line with evidence-based regimens.** Polypharmacy was frequent. Most patients in the sample received 1–3 drug types for HTN management with an average of three drugs per patient in each region. The most frequently prescribed drugs were ACE inhibitors, aspirin, and statins. However, there were considerable differences in the frequency of prescriptions for certain drugs between regions: patients sampled in the Poltava region were prescribed angiotensin receptor blockers twice as frequently as patients in the Lviv region, and prescription of aspirin was 20% higher in Poltava compared to the Lviv sample (see Figure 4.4). Polypharmacy (5+ regular HTN medications) among those receiving only HTN treatment<sup>21</sup> was higher in stage 3 patients. Predictors of higher numbers

of drug types included older age, longer duration of disease, and being female.

Figure 4.4: Frequencies of HTN drugs prescription in patients in 2016 in Lviv and Poltava regions



Source: Extracted from ambulatory care cards (form 025).

<sup>21</sup> Here we only account for HTN drugs not looking into pharmaceutical treatment of other diseases, such as diabetes mellitus or other.

.....  
*Among all HTN patients surveyed, only 9% had evidence of reaching ABC targets.*  
.....

**Treatment strategies (non-pharmaceutical): There was no indication that the diet, exercise, and lifestyle advice worked, given the BMI monitoring data.** According to HTN guidelines, all HTN patients should receive diet, exercise, and lifestyle advice. The analysis looked at changes in BMI over time as an indicator for patients' adherence to lifestyle advice. Only marginal changes in patients who were overweight or obese could be seen during patient follow-up after 6+ months compared to the BMI at diagnosis. In the Lviv and Poltava samples, from all included medical records indicating overweight or obese status of patients at HTN diagnosis, a quarter of patients achieved weight loss of at least 3%. However, only 7% had a weight reduction of greater than 10%, which would indicate that the advice was effective for lifestyle change. In

contrast, there were a greater number of patients who seemed to gain weight while on HTN treatment; about 14% of patients with initial excess weight added at least 3% to their baseline body weight (average weight gain in this group was 9%).

.....  
*Diabetes comorbidity significantly influenced the success of HTN treatment in the sampled patients, by a factor of 10 (Poltava) to 13 (Lviv).*  
.....

**The majority of HTN patients receive some ABC monitoring,<sup>22</sup> but only a few achieve full ABC control.** On average, 73% of patients in the Poltava region and 81% of patients in the Lviv region have results for all three ABC measurements in their medical records. However, the level of achievement of ABC control is low: from all patients with glucose tested within the normal range (A measurement), only 43% had BP within the target range (A and B measurements within norm), and only 19% also had LDL cholesterol within the target range (A, B, and C measurements within norm). Among all HTN patients surveyed, only 9% had evidence of reaching ABC targets.

**The main aim of HTN care—the achievement of normal BP levels while on treatment—is met successfully only by a minority of HTN patients, and most patients therefore remain at high risk of HTN-related morbidity and mortality.** Among all recorded HTN patients whose BP was monitored as per protocol, only 24% in the Lviv region and 35% in the Poltava region achieved the BP target (see Figure 4.1). Difficulties in achieving the BP target were as common among male as among female patients in both regions. Slightly better rates of BP control were observed in patients ages 35–59 years compared to those more than 60 years old. Most success in BP control was registered in patients with normal BMI. For instance, in the Poltava region, odds of achieving controlled BP were 3:1 for patients with BMI less than 25 compared to patients with BMI more than 30. In Lviv, the same odds were 1.6:1. Diabetes comorbidity significantly influenced the success of HTN treatment in the sampled patients, by a factor of 10 (Poltava) to 13 (Lviv), and this effect was likely a result of multiple factors including higher age and considerable diabetes-related vascular damage.

## Implications for Action

The study, conducted in collaboration with the regional Cardiology and Primary Care Teams, demonstrated the value of **analyzing routine medical record data as well as triangulating data across multiple data sources.** The MoH, Ukrainian Public Health Centers, Regional Department of Health, care providers, and technical agencies should collaborate to strengthen HTN care and chronic care models in general, with a focus on the following issues:

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<sup>22</sup> ABC measurements include (A) Fasting blood glucose: Normal < 5.6 (diabetics < 6.1 mmol/L\*); (B) Blood pressure: Normal < 140 or < 90 (diabetics < 130 or < 80\*); (C) LDL cholesterol control: Normal < 5 mmol/l (diabetics < 4.5 mmol/l\*) <100 mg/dL. The target is to achieve all three ABC measurements within norm.

- ▶ **Information should be disseminated on the HTN cascade, the identified breakpoints in care, and the performance of the services regarding treatment initiation, monitoring, and outcomes**, which can all guide quality improvements.
- ▶ Patients with HTN usually constitute the largest groups of patients with chronic disease in each primary care practice; therefore, health care providers at this level **should be fully equipped with knowledge, tools, and aids** to provide effective care to such patients.
- ▶ To properly monitor patients with HTN, the care teams should **understand patient risk factors and behaviors, establish trust, and proactively monitor patients**, especially in more complicated cases that are found to fail treatment targets. These include patients with a high BMI and those with diabetes co-morbidity. Patient support must extend beyond monitoring and include repeat counselling on adherence to medication and nutrition advice.
- ▶ **Coordination of care between levels of care and follow-up, especially of severe HTN and CVD cases**, need strengthening.
- ▶ **The recently published National Guidance on Screening<sup>23</sup> needs to be translated into systems of regular screening of all eligible individuals and local screening targets and systematic follow-up of HTN and diabetes cases** (Figure 2.1.).
- ▶ Hospital admission is a frequent outcome of poorly controlled HTN. **Effective management of HTN at the primary care level should translate to better health outcomes for patients and lower the number of avoidable hospitalizations.** Incentives to prevent hospitalizations and better support to patients at most risk should be provided to all stakeholders of the care cycle (patients, primary and secondary care providers).
- ▶ Gaps in data exchange and cooperation between specialized and primary care providers are a possible barrier to achieve better outcomes in HTN treatment and **these gaps need to be bridged with strengthened health information systems.**

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<sup>23</sup> MoH reported 17,000 less emergency calls associated with “Dostupni Liky” [Accessible Drugs] program after 1 year of its implementation <http://moz.gov.ua/article/news/dostupni-lyki-za-chas-roboti-programi-ukrainci-viklikali-shvidku-na-17-tisjach-raziv-menshe> Online dated 2018-05-25.



## Chapter 5: Type 2 Diabetes Care in Ukraine: Breakpoints and Implications for Action

Ukraine faces a triple health challenge from NCDs, infectious diseases, and the demographic situation with low fertility, out-migration, and excess adult male mortality (Twigg 2017). It also has the challenge of **refocusing its health systems** from a vertical hospital-based model with high hospitalization rates and length of stay to a community-based patient-centered model, emphasizing PHC, outpatient care, and health promotion. In short, it must move from a system designed for injury and infectious diseases to one designed for **better management of chronic care, prevention, and promotion**.

### Key Messages

1. Diabetes mellitus has become one of the **most serious public health problems** due to its increasing incidence, devastating complications if undiagnosed or untreated, and costs of patient care.
2. The cascade analysis identified the **breakpoints** along the type 2 diabetes care delivery chain in Lviv and Poltava regions. The **continuum of diabetes care** included the registration of diagnosed cases, link to care and treatment, glucose monitoring, and the attainment of sustained glucose control while on treatment. The analysis found significant breakpoints across the diabetes cascade.
3. **Screening and diagnosis.** Diabetic cases are identified at health facilities and in some outreach activities, but **up to 50% of cases are undiagnosed**. People may avoid diagnosis due to recurrent costs of care and low-risk perception of undiagnosed, untreated diabetes. Screening campaigns are poorly evaluated and not strategically targeted, and endocrinologists' patient data are not flowing back to the PHC level. Also, the PHC level has insufficient capacity to confidently address the diabetes epidemic.
4. **Link to appropriate care.** Health care providers lacked fit-for-purpose data system to flag people who are diagnosed but not in care or on treatment but failing targets.
5. **Treatment monitoring.** Glycated hemoglobin (HbA1C) testing is integrated in Poltava's diabetes program but not Lviv's where **42% of diabetics on medication have no record of HbA1C monitoring**. Self-monitoring and treatment adherence are not sufficiently supported by the public sector providers and non-pharmacological interventions on weight loss and physical activity is not well tracked and evaluated.
6. **Disease control.** Attainment of the HbA1C target was the largest breakpoint. In the Lviv region, **80%** of HbA1C monitored cases did not achieve the target, according to the 2016 routine statistics, and in Poltava, **73%** did not achieve the target in 2016. Patients experience economic (drug/monitoring costs), cognitive (knowledge, risk perception), psychological (fears, stigma), behavioral (nutrition habits), and medical barriers to sustained treatment adherence and long-term glucose control.
7. This analysis presents important **lessons and policy implications** for diabetes care in Ukraine: (a) diabetes **screening** needs to be strengthened for better targeting, follow-up, and evaluation; (b) the **PHC level** needs to have the confidence and capacity as well as resources to manage diabetes patients as tasks are shifted from specialists to family doctors; (c) the new **electronic medical record (EMR) system** can become the backbone for identifying patient-level gaps in prevention and care and inform quality improvement; (d) there are opportunities for **better diabetes patients' education and empowerment** toward assisted self-monitoring; and (e) the **cascade framework** offers an analysis approach to track change in the continuum of diabetes care as the

PHC reform takes effect and emphasizes the **importance of evaluating the final outcome** (glucose control among the entire diabetic population).

## Background and Rationale

Expenditure to finance diabetes treatment is high and growing, a recent costing study of the Ukrainian pharmaceutical market reported annual expenditure of US\$22.6 million in 2014 and US\$56.1 million in 2016 for oral antidiabetic medications alone.

**Type 2 diabetes mellitus (T2DM) is one of the leading causes of poor health and high health care expenditure in Ukraine.** There are close to 3 million adults with diabetes and T2DM prevalence is at 8.4%.<sup>24</sup> This puts Ukraine into an average position across Eastern and Central European countries for T2DM prevalence (Figure 5.1).

According to best estimates across countries by the International Diabetes Federation (IDF), Ukraine's level of undiagnosed diabetes at about 40% of all diabetes is on a par with several countries in the region (Figure 5.2). However, due to the size of Ukraine's population, this translates into **over 1 million undiagnosed cases**.<sup>25</sup> Expenditure to finance diabetes treatment is high and growing, a recent costing study of the Ukrainian pharmaceutical market reported annual expenditure of US\$22.6 million in 2014 and US\$56.1 million in 2016 for **oral antidiabetic medications** alone (Demchuck et al. 2018). The annual expenditure for diabetes in Ukraine is about **US\$460 million**.<sup>26</sup>

Figure 5.1: Diabetes prevalence in adults ages 18+ years, 2016

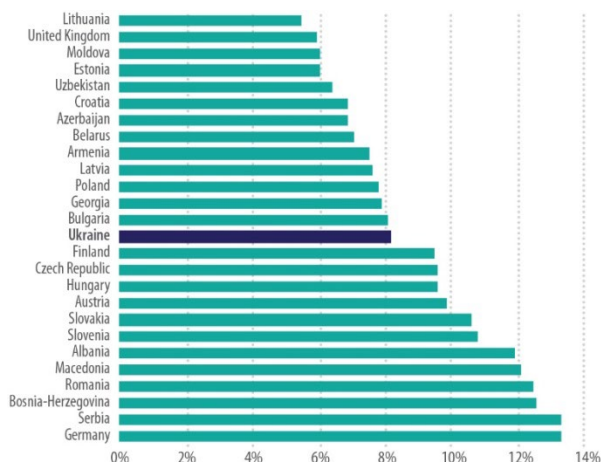
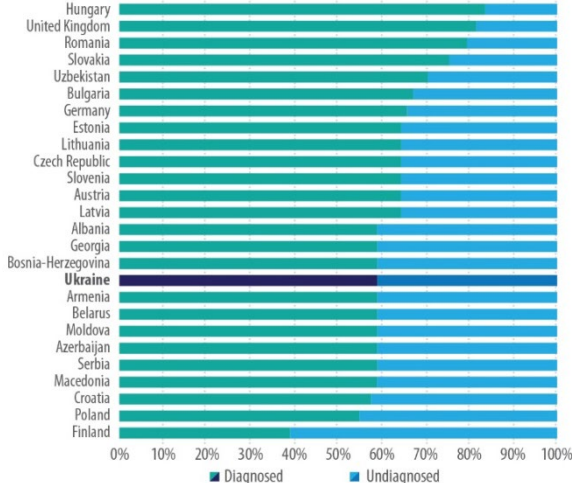


Figure 5.2: Undiagnosed diabetes in adults ages 18+ years, 2016



Source: IDF 2017a, estimates for 2016 for Eastern and Central European countries, as per IDF 8th Diabetes Atlas.

**Diabetes has become the seventh-most important cause of YLDs in Ukraine.**<sup>27</sup> According to the WHO, the occurrence of T2DM is a result of rising overweight and obesity rates, lifestyle and dietary changes, and an aging population.<sup>28</sup> The 2016 International Diabetes Management Practices Study reports very high hospital admission rates for diabetes cases in Ukraine (IDMPS 2017). About 77% of T2DM patients (and

<sup>24</sup> International Diabetes Foundation Atlas <http://diabetesatlas.org/resources/2017-atlas.html>; International Diabetes Foundation, Ukraine country report 2017 <https://reports.instantatlas.com/report/view/704ee0e6475b4af885051bcec15f0e2c/UKR>.

<sup>25</sup> Best IDF estimate was 1.153 million (0.785–1.923 million) for 2017, Ukraine country report 2017.

<sup>26</sup> Based on International Diabetes Foundation mean expenditure/case = US\$259 and 1.8 million diagnosed cases.

<sup>27</sup> IHM global burden of disease estimations <https://vizhub.healthdata.org/gbd-compare/>.

<sup>28</sup> WHO. Global Report on Diabetes 2016.

85% of type 1 diabetes cases) reported at least one hospital stay over the last 12 months. The same study reports high levels of vascular complications with 38% of T2DM and 18% of type 1 diabetes patients suffering from macrovascular complications (and over 9 out of 10 from microvascular complications). While diabetes is a major driver of disability and impaired quality of life, it is also directly responsible for over 40,000 deaths annually.<sup>29</sup>

Given patients' challenges to afford diabetes care, the Ukraine government has embarked on reimbursement schemes. An electronic register of diabetic patients was also introduced, forming the backbone to better patient monitoring, data on health service performance, and medical statistics.

Several reports have highlighted the charges Ukrainian diabetics face for medication, self-monitoring equipment, and routine laboratory tests (Doničová, Broz, and Sorin 2011). Given patients' challenges to afford diabetes care, the Ukraine government has embarked on reimbursement schemes. An electronic register of diabetic patients was also introduced, forming the backbone to better patient monitoring, data on health service performance, and medical statistics. Much of the ongoing difficulties in gathering reliable data comes from how diabetes care has been organized, with patients managed by endocrinologists in a parallel system to the patient care provided by family doctors (Doničová, Broz, and Sorin 2011). Lacking full integration between the PHC and specialist services, the recently established e-health system could not provide a comprehensive picture of patients' care and facilitate the continuity of their care. Disparate data systems lead to poor information about burden, diagnosis rates, treatment, and disease control in known diabetes cases.

In 2017, an analysis was conducted on the continuum of care for T2DM in two Ukrainian regions, Lviv and Poltava.

The 'cascade' framework was used for the analysis, where four questions were asked about the patient's pathway:

- ▶ Is the patient diagnosed as having a health condition?
- ▶ Is the patient linked to appropriate care and treatment?
- ▶ Is the patient monitored on the care regimen?
- ▶ Does the patient achieve disease control?

Failure at each stage of the cascade precludes success at the next, which means the cascade of care may tumble rapidly. The diabetes cascades were developed for the Lviv (2,534,174 inhabitants) and Poltava (1,431,110 inhabitants) regions to appraise the breakpoints in the care cascade and consider priority setting for the diabetes program. The analysis also provided a 2016 baseline before the introduction of an affordable medicines, patient reimbursement, and health sector strengthening program in these regions.

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<sup>29</sup> Best IDF estimate 41,500 (29,400–70,200) for 2017, Ukraine country report 2017.

## Findings

**Diabetes burden:** The total burden was estimated by combining estimates of diagnosed and undiagnosed diabetes and data triangulation. The data sources were the following:

.....  
The rates of registered diabetes per 10,000 adults were 315 for Lviv and 398 for Poltava.  
.....

- ▶ **For diagnosed diabetes:** Health index report 2016 providing prevalence of self-reported diabetes at regional and national levels in adults ages more than 18 years,<sup>30</sup> annual regional endocrinology reports 2016 (number of diabetics registered), and Ukraine data in the IDF database
- ▶ **For undiagnosed diabetes:** Reports of 2016 screening campaigns in both regions, using the positive yield among people reporting no preexisting diabetes,<sup>31</sup> expert opinion, and Ukraine data in the IDF database

It was estimated that total diabetes prevalence in adults was 3.7–6.3% in the Lviv region (74,000–129,000 diabetics) and 5.9–6.3% in the Poltava region (70,000–75,000 diabetics). The rates of registered diabetes per 10,000 adults were 315 for Lviv and 398 for Poltava.

**Care cascades:** All available routine data describing the T2DM continuum of care were brought together:

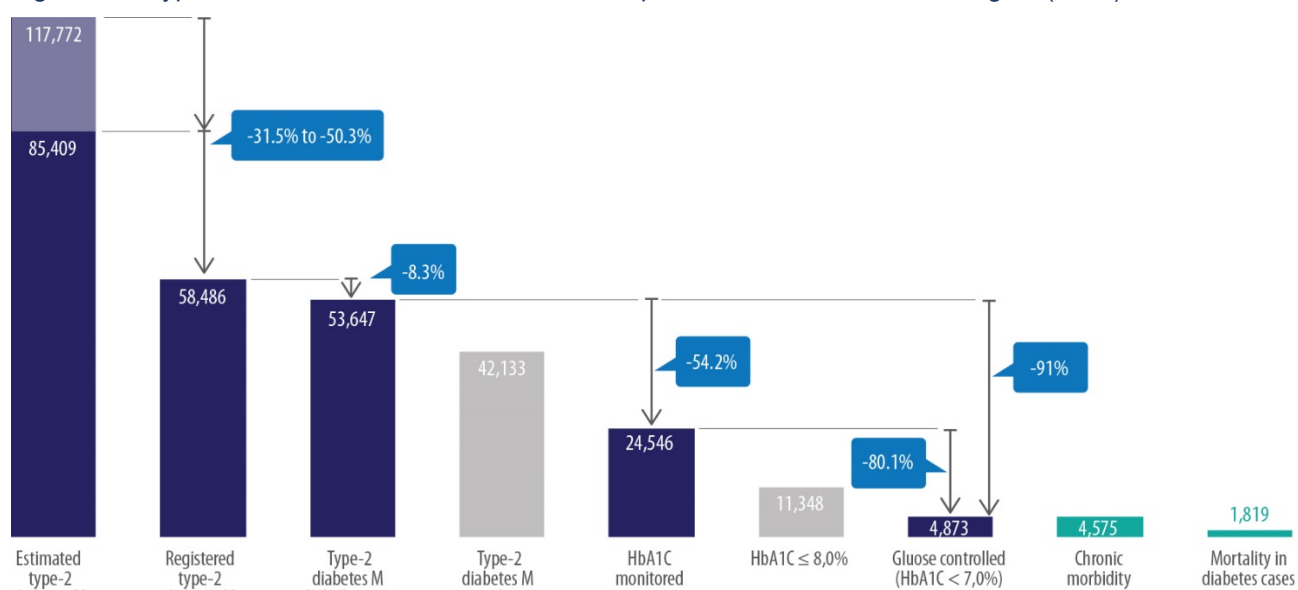
1. **Registered T2DM:** Total number of registered cases based on the endocrinology reports.
2. **T2DM linked to care:** Diabetics who are reported as under dispensary supervision, for either non-pharmacological treatment (lifestyle advice, diet, exercise) or pharmacological treatment (medication), using annual form #12 data from regional medical statistics units.
3. **T2DM on medication:** Total number of T2DM reported as on medication by the endocrinology reports.
4. **HbA1C monitored:** Applying reported HbA1C test coverage from endocrinology reports.
5. **Two levels of reported HbA1C test data were interpreted:** HbA1C  $\leq$  8% as an indicator for reasonable disease control (Diabetes UK, 2017) and HbA1C  $\leq$  7% as an indicator of sustained glucose control through effective management of the glucose metabolism.
6. **Data on chronic morbidity and mortality were also consulted:** Morbidity data came from endocrinology reports. Mortality in diabetes cases or deaths from diabetes-related causes came from diabetes register data and regional 2015 mortality statistics (the two regions reported diabetes mortality slightly differently).
7. In addition, there were patient-level data from a specially implemented patient card survey in Poltava. The results of this survey are reported after the main cascades.

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<sup>30</sup> IRF 2017. Health index Ukraine. 2016 report and 2016/2017 databases. International Renaissance Foundation.

<sup>31</sup> Lviv 2016 diabetes screening campaign on 38,175 non-pregnant adults 18+ without pre existing diabetes diagnosis, diagnostic yield is 1.4% (confirmed cases) and Poltava 2016 diabetes screening campaign on 400 adults without preexisting diabetes diagnosis, screening yield 7.5% and diagnostic yield is 1.9 percent.

Figure 5.3: Type 2 diabetes care cascades and breakpoints for adults in the Lviv region (2016)



Sources: Lviv region endocrinology report 2016 and annual form #12 statistics, Lviv Endocrinology Centre 2016 campaign summary, and demographic statistics.

Among those who had been registered at diagnosis, about 5,000 cases were not known to be under supervision and potentially lost to follow-up.

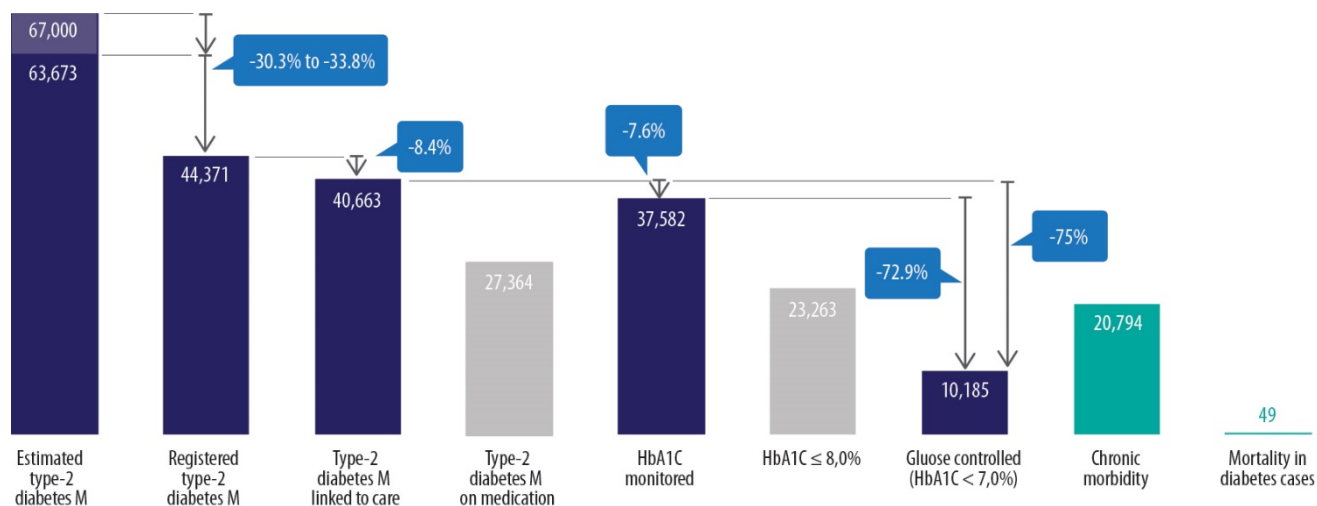
**In the Lviv region, there were several important breakpoints along the cascade** (Figure 5.3). We estimated that 32–50% of T2DM cases were not detected and registered. Among those that had been registered at diagnosis, about 5,000 cases were not known to be under supervision and potentially lost to follow-up. About 54% of patients linked to care (and 42% of patients on diabetes medication) did not get HbA1C monitored based on public sector statistics. Four out of five patients with HbA1C monitoring data did not attain the HbA1C target level. Therefore, **only 9% of T2DM cases recorded as linked to care (and 12% of cases on medication) had evidence of sustained glucose**

**control** (HbA1C < 7%). About 8% of registered Lviv cases were reported to suffer from chronic morbidity. Deaths in people on the diabetes register made up 5.5% of all reported deaths (using 2015 mortality statistics reporting 32,869 deaths in total in the region).

**In the Poltava region, disease detection was also a major breakpoint in the cascade with about a third of estimated cases missing from the diabetes register due to lack of detection** (Figure 5.4). About 8% were not linked to care.

In contrast to Lviv, HbA1C monitoring was implemented at higher coverage in Poltava's public sector once or twice annually for cases on both non-pharmacological and pharmacological treatment (an HbA1C test result is a condition for medicine prescription). Nevertheless, patients' glucose control was again a large breakpoint with over seven out of ten HbA1C-monitored cases failing to achieve the HbA1C target level of ≤7%. Overall, **only 25% of all T2DM cases linked to care (and about 63% of cases on medication) achieve the HbA1C target level**. Of all diabetics registered in the Poltava region, 47% were reported to have complications. Known diabetes deaths among registered patients made up 0.2% of all deaths (using 2015 mortality statistics reporting 24,498 deaths).

Figure 5.4: Type 2 diabetes care cascades and breakpoints for adults in the Poltava region (2016)

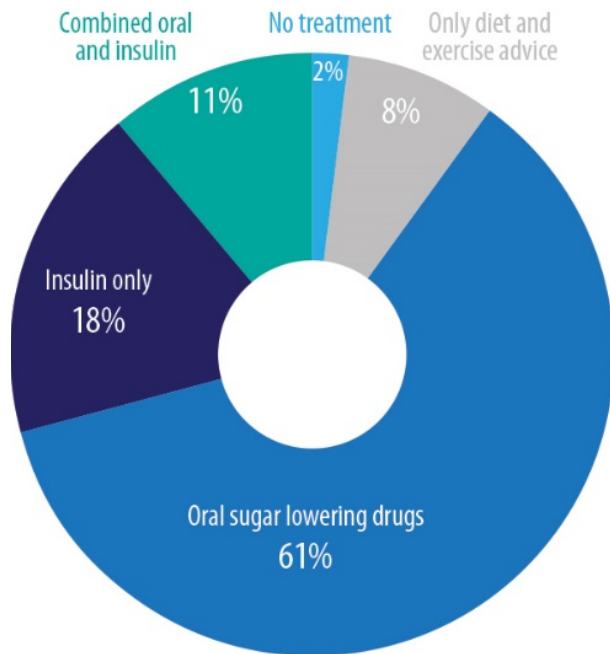


Sources: Poltava region diabetes statistics 2016 and annual form #12 statistics, Poltava 2016 diabetes campaign summary, and demographic statistics

**Diabetes patient card survey Poltava:** Anonymized patient data were evaluated to better understand treatment monitoring and glucose control. The following results were obtained from 398 of randomly selected ambulatory cards of Poltava diabetes cases:

- ▶ **Demographics:** About 61% were female and 71% were 60 years old or younger.
- ▶ **Risk factors:** About 85% were overweight or obese, and 77% were also known hypertensives at diabetes diagnosis ('comorbid patients').
- ▶ **Timing of treatment initiation:** About 93% of cases were initiated on the day of diagnosis, 96% within a month, and 98% had evidence of treatment initiation within 12 months.
- ▶ **Current treatment:** Most patients were on oral treatment (Figure 5.5), 29% were on insulin either alone or in combination, and 8% of patients were on non-pharmacological treatment (diet and exercise advice).
- ▶ **Treatment monitoring:** The penultimate and last monitoring visits were analyzed for test data (Table 5.1). Coverage of FPG monitoring was high at 97%, with a median interval of 83 days between FPG checks (79% of diabetic patients had FPG rechecked within six months, other random glucose checks not considered). Weight and BP were recorded at all patient visits. Cholesterol test coverage was slightly higher among comorbid patients. HbA1C results were not well reflected in the patient cards (and possibly not available at point of care), despite HbA1C monitoring being implemented according to the endocrinology report (see Figure 5.4). However, it could be concluded that while male and female patients had similar HbA1C test coverage (one in six), **male patients had significantly better glycemic control (42%) compared to female patients (20%)** using ≤7% cutoff.

Figure 5.5: Treatments in Poltava diabetes patients



Source: Extracted from ambulatory care cards (form 025)

Table 5.1: Treatment monitoring of Poltava diabetes patients (%) (2017 data)

	At penultimate visit	At last visit	At penultimate visit	At last visit
Weight	100	100	100	100
Cholesterol	62	51	49	32
BP	100	100	100	100
HbA1c	17	18	18	18
FPG	97	94	97	97
Random glucose test	13	13	29	25

Source: Extracted from ambulatory care cards (form 025).

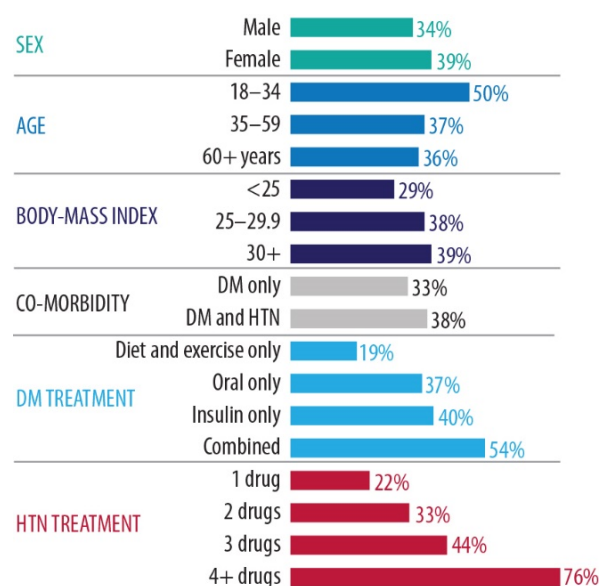
Using each patient’s penultimate and last FPG test results, we evaluated patterns of elevated FPG while on antidiabetic treatment.

.....  
 Patient cost for medication and monitoring tests seemed to be responsible for losses at each stage of the cascade.  
 .....

Young diabetes patients and those on treatment combinations for T2DM and HTN had poorest glucose control (Figure 5.6). Best FPG results were seen in patients provided with advice but no medication, but these patients were mainly prediabetics. The other group with relatively better success in glucose control was comorbid patients on monotreatment for HTN compared to receiving multiple HTN drugs.

To better understand the underlying reasons for the breakpoints in care, the study team reviewed available information on barriers to diabetes care (Table 5.2). Patient cost for medication and monitoring tests seemed to be responsible for losses at each stage of the cascade. In Ukraine’s decentralized health system, the barriers on the health provider side may vary across regional health administrations; for instance, providers in the Lviv region were not able to offer free HbA1C monitoring whereas Poltava providers had budget allocations for offering the test.

Figure 5.6: Prevalence of elevated FPG in Poltava patient groups (2017)



Source: Poltava patient cards 025, combining FPG test results from penultimate and last visit.

Table 5.2: Patient and provider barriers in diabetes cascades as of 2016

Barriers to...	Patient side	Provider side
Screening/diagnosis	<ul style="list-style-type: none"> <li>• Cost of diagnosis (for example, test strips)<sup>1,3</sup></li> <li>• Awareness of future treatment costs<sup>2</sup></li> <li>• Health seeking and disease prevention behaviors<sup>2</sup></li> <li>• Lack of risk perception<sup>2</sup></li> <li>• Skepticism about treatment<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Weak integration of diabetes in primary care, low confidence to deal with diabetes at the PHC level<sup>3,6</sup></li> <li>• Lack of statistics at the PHC level, for example, glucose tolerance test<sup>6</sup></li> <li>• Poor information flow endocrinologist—family doctor<sup>5</sup></li> <li>• Lack of health policies in companies<sup>2</sup></li> <li>• Prediabetics not in register leading to initial losses<sup>2</sup></li> <li>• Noncompliance with screening guidelines at the PHC level</li> </ul>
Treatment initiation	<ul style="list-style-type: none"> <li>• Cost of oral anti-diabetes drugs<sup>1,3,4</sup></li> <li>• Cost of insulin analogs<sup>3,4</sup></li> <li>• Poor knowledge of disease<sup>4</sup></li> <li>• Nonadherence to lifestyle changes<sup>2</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Poor patient support for link to treatment</li> <li>• Consultations too short for proper patient engagement<sup>2</sup></li> </ul>
Treatment monitoring	<ul style="list-style-type: none"> <li>• Need to pay private laboratory for routine HbA1C testing (costing US\$4–5)<sup>6</sup></li> <li>• Need to purchase self-monitoring equipment<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Low availability of HbA1C test in public sector</li> </ul>
Treatment adherence/disease control	<ul style="list-style-type: none"> <li>• Fear of hypoglycemia<sup>1</sup></li> <li>• Episodes of hypoglycemia<sup>1</sup></li> <li>• Long-term cost of drugs (low income)<sup>4</sup></li> <li>• Poor access to free insulin pumps<sup>3</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Insufficient insulin titration<sup>1</sup></li> <li>• Lack of routine system to track ABC control</li> <li>• Lack of PHC test capacity to detect vascular flow problems<sup>6</sup></li> </ul>

Sources: 1. International Diabetes Management Practices Study (Ukraine data from 53 physicians and 795 patients); 2. Lviv endocrinologist interviews; 3. Doničová et al. 2011; 4. Matiukha et al. 2016; 5. key informant ambulatory care level; 6. Lviv program costing and coverage assessment.



## Implications for Action

The study, conducted in collaboration with the regional Endocrinology, Cardiology, and Primary Care teams, demonstrated the value of **analyzing routine medical record data as well as triangulating data across multiple data sources**. The analysis coincided with the early rollout of the PHC reform that aims to bring a guaranteed service basket to patients and reimbursement of diabetes medication costs, as well as an EMR system. These changes can significantly improve diabetes prevention and care. The finding of very low levels of glucose control in diabetic cases in both regions in 2016 was alarming and called for action - only 9% of Lviv-registered cases and 23% of Poltava-registered cases had evidence of good glucose control. Internationally, the level of achievement of successfully controlled diabetes varies greatly. It ranged from 19-31% in the U.S. county study by Dwyer-Lindgren et al. (2016), was 37% in T2DM patients in Asia's IDMPS study (Chan et al. 2009), 27% in Saudi Arabia (Al-Elq, 2009), 40% in Germany (Pittrow et al. 2006), and 67% in Finland (Valle et al. 1999).

Therefore, the MoH, Public Health Centers, Regional Department of Health, care providers, and technical agencies should collaborate to strengthen diabetes care models, with a focus on the following issues:

- ▶ **Information should be disseminated on the diabetes cascade, the identified breakpoints in care,** and the performance of the services regarding diabetes screening, link to care, treatment, and its monitoring, and patient outcomes, which can all guide quality improvements.
- ▶ **Diabetes is a complex, prevalent, and costly disease,** and providers at the PHC level should therefore be equipped with knowledge, tools, and aids to provide effective diabetes prevention and patient care to prevent diabetes-related vascular damage and clinical complications.
- ▶ **The National Guidance on Screening (Ustinov 2018) needs to be translated into systems of regular screening of all eligible individuals and systematic follow-up of identified cases.** The guidance recommends annual diabetes screening for persons ages 45 years and older and for younger persons with excessive body weight, abdominal obesity, gestational diabetes, or a family history of diabetes.
- ▶ **Screening campaigns to find the 'missing cases' are important** but must be targeted to age and BMI/risk categories and tracked on the EMR system for efficiency (with implementation of (International Classification of Primary Care (ICPC-2) coding). Staff must be oriented on eligibility criteria and screening frequency, and automated electronic reminders should be generated by the system to facilitate patient follow-up.
- ▶ **Treatment must have a strong component of patient monitoring and targeted support to patients who struggle with adherence.** Patient education and motivational counselling should be ensured to strengthen treatment adherence and improve overall outcomes given the link between patients' risk factors and diabetes/CVD complications (IDF 2016) (48% of patients were obese at diabetes diagnosis with a BMI of 30 or above).
- ▶ **The capacity of the PHC to manage diabetes and HTN is key** as the management of uncomplicated cases is transitioning from endocrinologists to family doctors. This requires continuous education on good prescription practices and the effective use of diagnostic equipment. Coordination of care between levels of care and follow-up especially of severe HTN and CVD cases need strengthening.
- ▶ **A continued analysis of the diabetes care cascade should help monitor the breakpoints and determine the impact on patient outcomes** of drug reimbursement, PHC strengthening, and EMR-facilitated patient monitoring. Measures of success should include screening coverage, patient monitoring as per norm, and test results (levels of glucose, BMI, cholesterol). Population-level data on undiagnosed, untreated, and uncontrolled diabetes and HTN should be collected regularly at both national and local levels, for evaluation and target setting. International evidence on the importance of patient education, assisted self-monitoring, and incentive schemes should be consulted for further development of the diabetes program.

## Chapter 6: Breast Cancer in Ukraine: The Continuum of Care and Implications for Action

*The main strategy in Ukraine to detect BC early is to offer an annual preventive gynecological examination, which includes a clinical breast exam, to all females ages 18 years and above.*

BC is the main type of cancer in Ukrainian females.<sup>32</sup> Ukraine has seen little change in BC burden in the last 25 years: BC remained the 4th most important NCD cause of YLLs in 2016, responsible for 3.4% of all YLLs in 2016 (3.5% in 1990). BC was also the 5th cause of NCD-related death in 2016 (rank 6 in 1990). Population ageing, changing childbearing patterns, and adoption of modern lifestyles affect BC risks.

However, there is evidence of programmatic progress with a shift to earlier BC detection, possibly supported by more effective treatment. Some stage shifting occurred in the last 15 years with **76%** of BC cases detected at stages I–II in 2015 compared to **69%** in 2003.<sup>33</sup> Conversely, **9.7%** of cases were only diagnosed at stage IV in 2015, down from **14.5%** in 2000, and first year mortality post diagnosis was down from 14.5% in 2000 to 9.7% in 2015.

### Key Messages

1. Analysis of the BC continuum of care highlights breakpoints in patients' journeys from screening to diagnosis, treatment, and longer-term monitoring.
2. Public sector routine data in two Ukraine regions show that only 36% (Lviv) and 61% (Poltava) of eligible women were screened for BC in 2016 (screening gaps of 64% and 39%, respectively). At least 3 of 10 positive screenings were followed up with diagnostic tests.
3. Among the diagnosed cases, negative outcomes (death, loss to care, treatment refusal, and withdrawal from treatment) were not sufficiently documented in both regions, calling for urgent attention to outcomes. In the 2015 treatment cohorts, 56% (Lviv) and 25% (Poltava) had no record of BC treatment completion.
4. Understanding of diagnosis and treatment gaps and delays from cascade analysis helps identify solutions ranging from simplified decision making for cancer treatment to improved pharmaceutical supplies and access to diagnostic equipment.
5. Systems for age- and risk-appropriate screening invitations and recalls need to be developed in Ukraine for earlier detection of cases and an overall more efficient BC program.

### Background and Rationale

The main strategy in Ukraine to detect BC early is to offer to all females ages 18 years and above an annual preventive gynecological examination, which includes a clinical breast exam. About 50% of BC cases are found during these preventive exams.<sup>34</sup> Females with a positive clinical breast screen should be followed up with diagnostic mammography and breast ultrasound. In 2016, based on long-standing international evidence of the effectiveness of screening mammography for earlier BC detection, stage shifting, and

<sup>32</sup> Bulletin of National Cancer Registry of Ukraine No. 18, 2015-2016. [http://www.ncru.inf.ua/publications/BULL\\_18/PDF\\_E/05\\_struc10.pdf](http://www.ncru.inf.ua/publications/BULL_18/PDF_E/05_struc10.pdf). IHME 2017c.

<sup>33</sup> National Cancer Institute. National Cancer Registry. <http://unci.org.ua/en/for-specialists/national-cancer-registry/>.

<sup>34</sup> National Cancer Institute. National Cancer Registry. <http://unci.org.ua/en/for-specialists/national-cancer-registry/>.

reduced mortality, some Ukraine regions started developing a system of mammography screening, accompanied by awareness and public education interventions and health sector support activities.

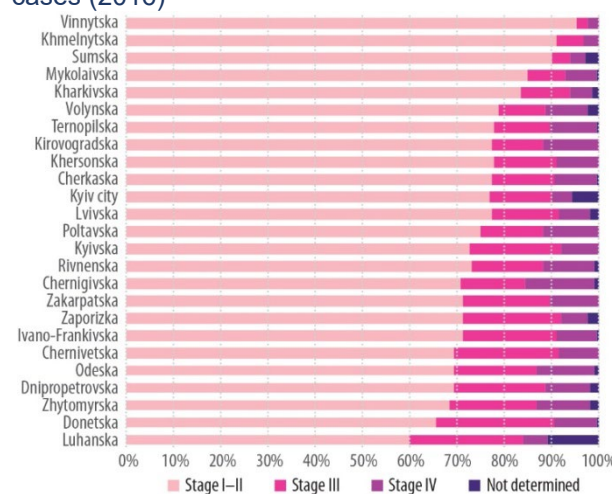
In 2017, an analysis was conducted on the continuum of care for BC in two Ukrainian regions, Lviv and Poltava, to determine the breakpoints in the care cascade and opportunities for action.

The analysis also provided a 2016 baseline before the introduction of a BC prevention, screening, and health sector strengthening program in the Lviv Region. The program was developed after consultation with specialists from the International Agency for Research on Cancer in 2015, considering the recommendations from the MoH on BC screening issued in February 2018 (Ustinov 2018).

## Findings

Early BC detection varies widely between regions, from 95% of all BC cases detected at tumor, node, metastasis (TNM) stages I and II in the Vinnytsia region to only 60% detected early in the Luhansk region in 2016 (Figure 6.1). Lviv and Poltava regions were within the national average.

Figure 6.1: TNM<sup>35</sup> staging distribution of new BC cases (2016)



Source: National cancer bulletin on C50 (2016)

Figure 6.2: First-year BC mortality (2001, 2011–2016)



Source: National cancer bulletins 2001, 2011–2016

In both regions, there was also a gradual decline of first-year BC mortality over the last 15 years (Lviv: 37% reduction from 2001 to 2016, Poltava: 34%, see Figure 6.2). This likely reflects progress associated with the introduction of immunohistochemical testing, targeted and modern anti-estrogen drugs, and the inclusion of patients in international clinical trials.

<sup>35</sup> Cancer Research UK. Breast Cancer: Breast Cancer Stages, Types, and Grades. TNM staging. <http://www.cancerresearchuk.org/about-cancer/breast-cancer/stages-types-grades/tnm-staging>.

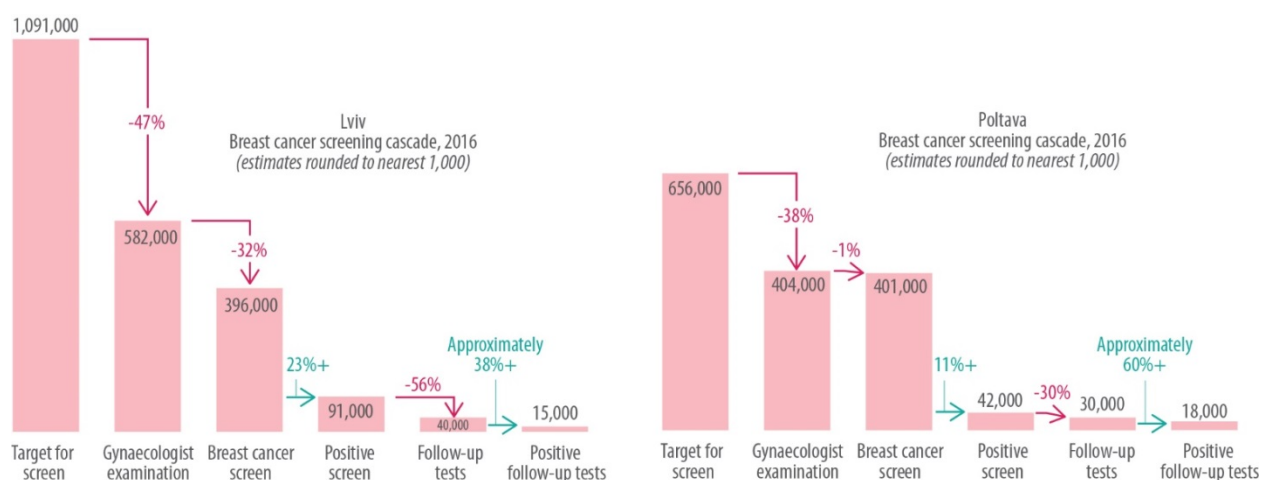
## Screening cascade: Issues of coverage and record keeping

Of all eligible females, 47% in Lviv region and 38% in Poltava region did not have a gynecological examination.

The screening cascade in both regions was determined by the coverage of the annual preventive examination, which is the entry point to the clinical breast screen (Figure 6.3). Of all eligible females, 47% in the Lviv region and 38% in the Poltava region did not have a gynecological examination according to the Health Index Survey 2016 (the national value is 45%).<sup>36</sup> According to ambulatory patient card data, there was another breakpoint in the cascade in the Lviv region with 32% of women not undergoing the clinical breast screen during the gynecological exam. However, this might be partly due to poor recording of negative screenings (indicated by a high proportion of positive screenings at 23% in Lviv versus 11% in Poltava).

In Poltava, the clinical breast screening was well recorded, with only 1% of women with gynecological exams lacking a record of the breast screening result.

Figure 6.3: BC screening cascades for 2016 in Lviv and Poltava regions



Sources: Lviv and Poltava regional demographic statistics (target to screen), Health Index Report 2016 (gynaecologist exam), ambulatory care data from women's consultation units form 025 (mammary palpitation screen, screening result, diagnostic mammography and breast ultrasound for follow-up of suspects, follow-up test results).

To compare the Lviv and Poltava screening levels, we looked at BC screening coverage levels in England. These statistics show the coverage of mammography services (and not mammary palpitation) among eligible women. In 2019, breast screening coverage in England was 75% i.e. approximately six million women were eligible for screening and 4.5 million women had been screened within the last three years (NHS Digital 2020). The England program uses 80% coverage as its optimal performance standard and was closest to this level in 2011, when breast screening reached a coverage of 77.2%.

### Diagnosis: Important losses to follow-up

Positive breast screens require follow-up with diagnostic mammography or breast ultrasound and verification with biopsy; however, 56% (Lviv) and 30% (Poltava) had no evidence of such follow-up examinations in their patient cards (Figure 6.3). These follow-up tests move women closer to a diagnosis, including mastopathy, cysts, breast calcifications, lipogranuloma, and benign and malignant breast

<sup>36</sup> Health Index Survey Report 2016.

changes. The follow-up data probably lack some test data from the tertiary level of care which are not always captured in the primary-level medical cards of patients.

BC incidence per 100,000 females was 68.5 in the Lviv region and 71.3 in Poltava.<sup>37</sup> Assessing the age pattern and staging results of registered first-time episodes of BC can inform screening strategies. About one in five cases diagnosed was below 50 years (Lviv: 21%, Poltava: 18%, 2015–mid-2017 data) (Figure 6.4). Invasive, stage IV cancer was diagnosed in 7% (Lviv) and 11% (Poltava) of all registered BC cases, respectively. Stage II cancers were the most frequently diagnosed in both regions. According to the 2018 cancer screening recommendations for the MoH Ukraine,<sup>38</sup> females ages 50–69 years should receive mammography screening every two years, and women with risk factors<sup>39</sup> should commence screening from age 40. This is not fully consistent with the Gail model for BC risk assessment and the National Comprehensive Cancer Network guidelines recommended by the MoH as one of the sources of clinical protocols in oncology in Ukraine. Also, the role of the clinical breast exam is not explicitly provided in the 2018 recommendations (see also Figure 2.4. on global lessons).

**BC cases: Most cases registered in stage II were ages 50 years and older.**

.....  
*BC incidence per 100,000 females was 68.5 in Lviv region and 71.3 in Poltava.*  
 .....

**Treatment strategies: The variation of treatment observed in two regions, particularly in stages II and IV, is mostly explained by available equipment and treatment options.**

Most cases received combination treatment (Figure 6.5). The treatment patterns for each stage were comparable between the two regions, but the local oncology teams concluded that a further reduction of surgery monotherapy of stage III cancers is important for appropriate patient care.

Figure 6.4: BC cases registered 2015 to mid-2017 in Lviv and Poltava regions, by age group and cancer stage

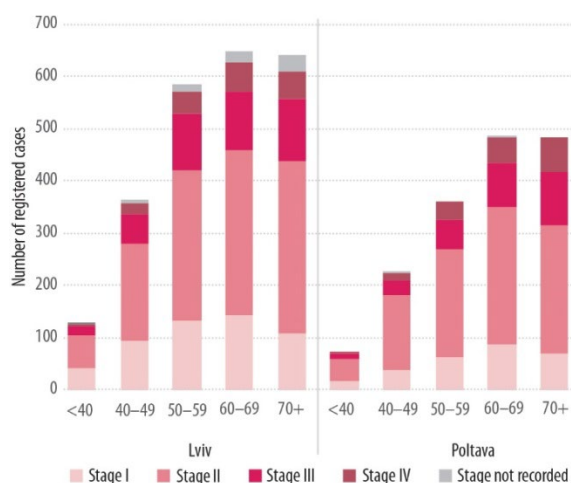
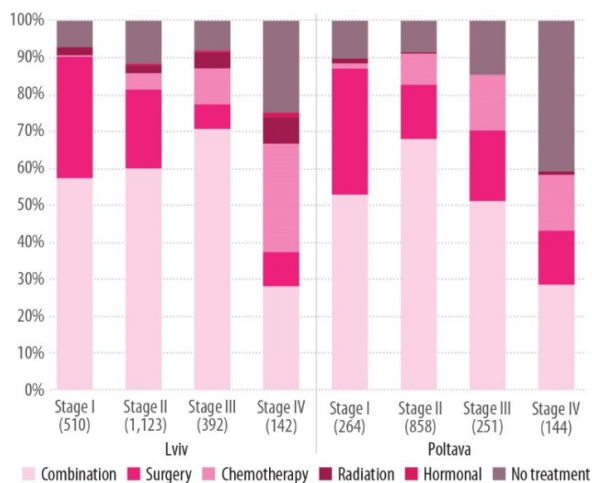


Figure 6.5: BC treatment in Lviv and Poltava regions, by cancer stage, 2015 to mid-2017



Source: Cancer registries 2015 to mid-2017 - Lviv and Poltava regions.

<sup>37</sup> Breast cancer statistics, Bulletin of National Cancer Registry of Ukraine № 18, 2015–16.

<sup>38</sup> Ustinov O.V. (2018). Recommendations for disease screening and periodic examinations at the primary health care level developed by the Ministry of Health of Ukraine. Medychny Chasopys (Medical Bulletin) Online dated 2018-02-13.

<sup>39</sup> Risk factors listed in the guidance note are the following: Confirmed BRCA-1/2 mutation, burdened hereditary anamnesis (BC of relative in 1–2 degree of relationship), radiation therapy of chest in anamnesis, late first giving birth to a child (≥30 years), infertility, late menopause (≥55 years old), prolonged hormone replacement therapy for menopause, postmenopausal obesity, drinking alcohol, smoking, sedentary way of life, and background precancerous diseases.

.....  
*The local oncology teams concluded that a further reduction of surgery monotherapy of stage III cancers is important for appropriate patient care.*  
 .....

The cancer registry data were analyzed for ‘time-to-treatment’, another parameter not routinely reviewed by the oncology teams. In 2016, the average interval between diagnosis and treatment start was 28 days in the Lviv region and 20 days in the Poltava region. In Lviv, the interval was slightly longer for more advanced BC (30 days for stage III treatment initiation, 32 days for stage IV). This was likely due to the multistep decision-making processes associated with complex, individualized treatment plans. The need for improved pharmaceutical supplies for cancer units was emphasized, especially by the Lviv oncology team. In both regions, the required diagnostic equipment was in some instances not available or outdated. The local oncologists found that time-to-treatment could potentially be reduced for stage I cancers, down from 22 days (Lviv) and 19 days (Poltava) due to the simpler treatment regimens.

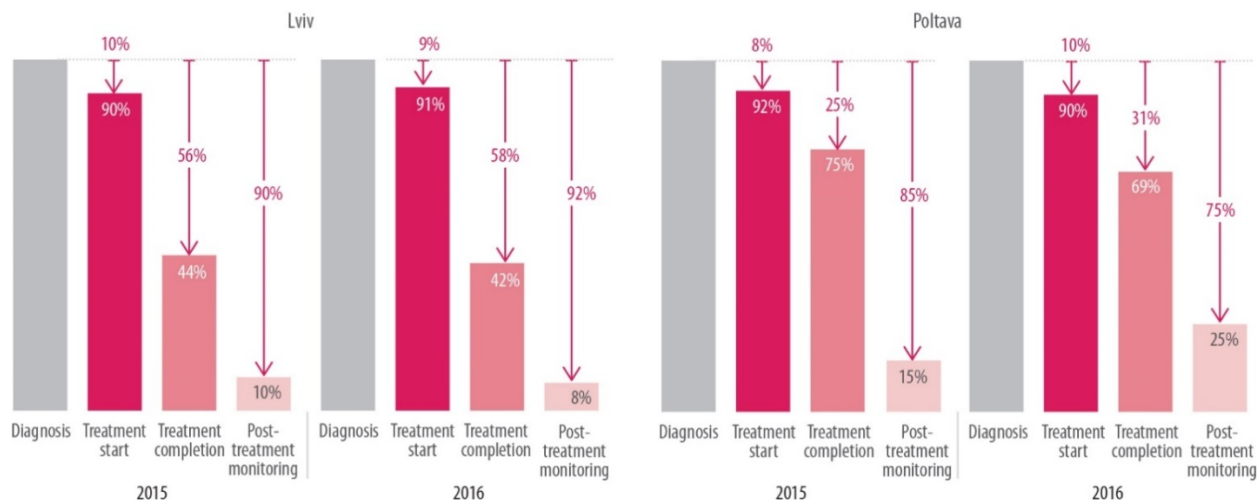
**Treatment cascade: Patient-level data on confirmed first episodes of BC were assessed for the continuum of care.**

The three main stages assessed were the following:

1. The percentage of diagnosed BC cases initiated on treatment
2. The percentage of cases with confirmed treatment completion (first episode only)
3. The percentage of cases who had evidence of post-treatment monitoring

Data were analyzed for two annual cohorts, 2015 and 2016, to prevent truncated data due to insufficient follow-up time (data extracted from registries in October 2017) (Figure 6.6).

Figure 6.6. BC treatment cascades for 2015 and 2016 as per cancer registry data in Lviv and Poltava regions



Sources: Cancer registries, BC cases newly registered in 2015 and 2016 - Lviv and Poltava regions.

.....  
*In both regions and annual cohorts, about 1 in 10 cases had no record of treatment initiation in the cancer registry.*  
.....

In both regions and annual cohorts, about 1 in 10 cases had no record of **treatment initiation** in the cancer registry (Figure 6.6 - 10% and 9% in Lviv, 8% and 10% in Poltava). In Lviv, about 4% of cases had evidence of linking to care after diagnosis but did not start treatment. According to the oncologists, this was due to high age, advanced cancer, and treatment refusal, but the entries in the registry were not systematic. Another 4% of cases seemed lost to care with no registry entries after diagnosis. There were also a few out-transfers (9 of 2,367 total cases). Finally, about 2% of cases lacked treatment information most likely due to pre-treatment death. In Poltava, almost all patients foregoing treatment had evidence of linking to care. Again, reasons for not receiving treatment were not systematically

recorded. In both regions, it was often unclear at what stage of the continuum of care a patient's death occurred.

### **Treatment completion was poorly recorded in the registry (Figure 6.6).**

For 2015 and 2016, respectively, 56% and 58% of Lviv's annual cohorts lacked data on the status or date of treatment completion, and 25% and 31% of Poltava's cohorts. In Lviv, a small number (14 of 2,113 treatment-initiated cases) withdrew from treatment, and therefore did not have a treatment completion date. In Poltava, no data could be found on withdrawal while on treatment.

.....  
*The lack of following patients through also means that women with BC history may not be systematically recalled for high-frequency screening.*  
.....

### **Post-treatment monitoring was mostly not documented.**

In the registry, about 9 of 10 Lviv cases and 8 of 10 Poltava cases had no evidence of being monitored. This was explained by the lack of information from family doctors to flow back to the registry, including information on patient death. Five-year survival could therefore not be calculated. The lack of following patients through also means that women with BC history may not be systematically recalled for high-frequency screening.

## **Implications for Action**

- ▶ The study, conducted in collaboration with the regional oncology teams, demonstrated the value of **analyzing cancer registry data on strategic key information** such as time-to-treatment, treatment coverage, loss to care, and treatment patterns (each by cancer stage) to guide quality improvements.
- ▶ To **initiate cancer treatments without delay**, the oncology teams need to have clear procedures, improved pharmaceutical supplies, and access to reliable diagnostic equipment.
- ▶ Coordination of care between levels and follow-up of cancer cases needs strengthening.
- ▶ Better data flow to the Cancer Registry Units would improve the understanding of **timing and prevalence of death** and ultimately provide estimates of 5-year survival. It would also strengthen data on treatment completion and post-treatment monitoring, which the oncology teams consider important.
- ▶ The recently published National Guidance on Cancer Screening (Ustinov 2018) needs to be translated into **systems of targeted invitations and patient recall**, bearing in mind individuals' age and risk (Figure 2.4).

## Chapter 7: Cervical Cancer in Ukraine: The Continuum of Care and Implications for Action

**CC is an important disease in Ukraine.** Among all cancers in females, it ranks 5th for incidence and 6th for mortality.<sup>40</sup> The importance of CC as a cause of premature death in females has decreased slightly over the last 25 years, accounting for 1.6% of YLLs in 1990 and 1.3% of all YLLs in 2016 (IHME 2017c).

### Key Messages

1. Cascade analysis provides a **framework to assess the continuum of care** from screening to full diagnosis, treatment start, treatment monitoring and adherence, and outcomes. Such analyses of the continuum of care highlight **breakpoints in the patient pathway** and can be used to prioritize efforts for health care improvements.
2. In this present cascade analysis, public sector routine data in two Ukraine regions show that only 53% (Lviv) and 62% (Poltava) of eligible women were screened for CC in 2016, that is, **screening gaps of 47% and 38%**, respectively.
3. Of all the screenings, 13% in Lviv were targeted at women below 30 years and 18% in Poltava. This is because of Ukraine's CC screening eligibility from 18 years, to encourage screening at an early age.
4. Percentages of women with positive screenings varied by age, with the **highest positive yield among women older than 50** (dysplasia reported in 0.7% of women below 30 years, 2.1% in women 31–50 years, and 4.7% in women above 50 years).
5. **Screening intervals were short in many women**, leading to efficiency concerns: 47% of women had evidence of an interval less than 1 year and 84% had a less than 2-year interval.
6. Among the diagnosed CC cases, negative outcomes (death, loss to care, treatment refusal, and withdrawal from treatment) were not sufficiently documented in either region, calling for **urgent attention to track all care outcomes**. In the 2015 treatment cohorts, 38% (Lviv) and 24% (Poltava) had no record of CC treatment completion.
7. Systems for **age- and risk-appropriate screening** need to be developed in Ukraine for earlier detection of cases and an overall **more efficient CC program**.

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<sup>40</sup> Bulletin of National Cancer Registry of Ukraine No. 18, 2015-2016.  
[http://www.ncru.inf.ua/publications/BULL\\_18/PDF\\_E/05\\_struc10.pdf](http://www.ncru.inf.ua/publications/BULL_18/PDF_E/05_struc10.pdf).



## Rationale

Over the 15-year period from 2002 to 2016, progress in earlier detection of cervical cancer has however been small, and first-year mortality showed a modest decrease.

Over the 15-year period from 2002 to 2016, progress in earlier detection of CC has however been small, and first-year mortality showed a modest decrease. In 2016, 77% of CC cases were detected in stages I–II, compared to 75% in 2002; 4.8% of cases were first diagnosed at stage IV in 2016, compared to 5.6% in 2002. First-year mortality post diagnosis decreased from 19.3% of all CC cases in 2002 to 15.2% in 2016 (IHME 2017c).

Overall, 49% of CCs were found during routine preventive examinations for women. Among those with a positive cancer diagnosis, 79% received anti-cancer treatment in 2016.<sup>41</sup>

According to Ukrainian national guidelines (as of 2017), every woman ages 18–60 years should have a cytological test for CC every year and should not wait more than the maximum of three years between examinations.<sup>42</sup> Health care providers have been conducting cytology-based cervical screening programs as part of routine care in Ukraine, which includes a cytological smear during the

preventive women’s examination by gynecologists. Suspect smear test results should be followed up with a cytology recall. Pelvic ultrasound exams are also conducted as a follow-up examination.

In 2017, an analysis was conducted on the continuum of care for CC in two Ukrainian regions, Lviv and Poltava, to assess the breakpoints in the care cascade and identify opportunities for strengthening CC control.

The analysis also provided a 2016 baseline before the introduction of a CC prevention, screening, and health sector strengthening program in the Lviv region and referred to recommendation from the MoH Ukraine on CC screening issued in February 2018 (Ustinov 2018).

## Findings

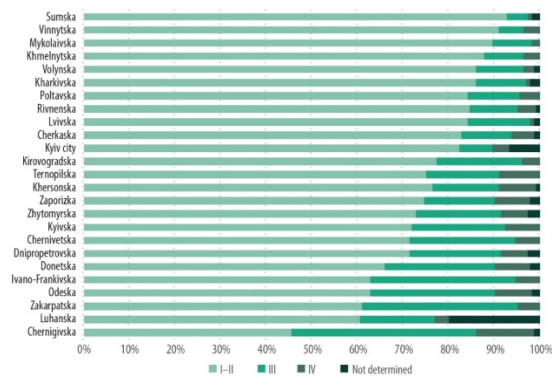
At over 80 percent, Lviv and Poltava are above the national average for early detection of cervical cancer.

The official 2016 CC surveillance data show stark differences across Ukraine in the early detection of CC at stage I–II, ranging from a low of 45% in Chernihiv region to more than 90% in Sumy region. At over 80%, Lviv and Poltava regions are above the national average for early detection of CC (Figure 7.1). In both regions, there was also a gradual decline of first-year CC mortality over the last 15 years (Lviv: 37% reduction from 2001 to 2016, Poltava: 34%; Figure 7.2). This may be a combined effect of earlier detection and better CC care.

<sup>41</sup> Cervical cancer statistics, Bulletin of National Cancer Registry of Ukraine № 19, 2015-2016. [http://www.ncru.inf.ua/publications/BULL\\_19/PDF/46-47%20shm.pdf](http://www.ncru.inf.ua/publications/BULL_19/PDF/46-47%20shm.pdf)

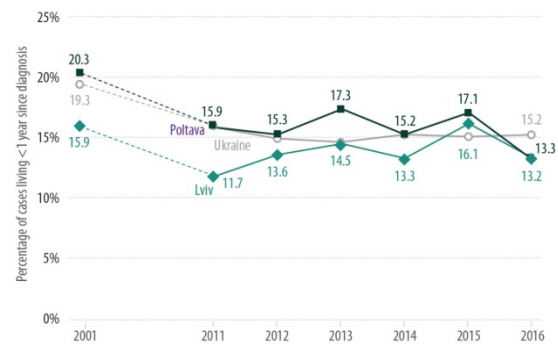
<sup>42</sup> [http://mtd.dec.gov.ua/images/dodatki/2014\\_236\\_RakShyjkyMatky/2014\\_236YKPMR\\_RSHM.pdf](http://mtd.dec.gov.ua/images/dodatki/2014_236_RakShyjkyMatky/2014_236YKPMR_RSHM.pdf)

Figure 7.1: Stage distribution of new CC cases (2016)



Source: National cancer bulletin on C53 (2016).

Figure 7.2: First-year CC mortality (2001, 2011–16)



Source: National Cancer Bulletins 2001, 2011–16.

HPV vaccination campaign had been established in the Lviv region. Due to low vaccination coverage, it is impossible to measure the impact the age range of girls' vaccination was too high due to this complicated to follow up the result in the future.

CC vaccination and treatment is not included in guaranteed packaged paid by the state budget, therefore, it will be difficult to increase woman involvement in the prevention campaign

### Screening cascade: Defining Stages

The screening cascade in both regions was determined by the coverage of the annual preventive examination among eligible females (ages 18 and above), which is the entry point to the clinical cervical screening (Figure 7.3).

To achieve this, the following stages were defined:

1. The percentage of eligible women covered by the annual gynecologist examination (based on screening eligibility and using 2016 demographic and Health Index Survey data)
2. The proportion of women screened for CC as per norm (based on ambulatory patient card data)
3. The proportion of women with a suspect CC screen receiving a follow-up investigation within 6 months (ambulatory patient cards)

Of all eligible females, 47% in Lviv Region and 38% in Poltava Region did not have a gynecological examination according to the Health Index Survey 2016.

### CC screening: Issues of coverage, record keeping and efficiency

Of all eligible females, 47% in the Lviv region and 38% in the Poltava region did not have a gynecological examination, according to the Health Index Survey 2016 (the national value is 45%).<sup>43</sup> According to ambulatory patient card data, almost all women have been undergoing the clinical CC screening during the gynecological exam in the Lviv region (98%) and the Poltava region (99%). We triangulated two data points on the estimated number of Pap smears, one using the abovementioned Health Index Survey and patient card data (coverage-based cascade estimate, Figure 7.3) and one using cytology laboratory

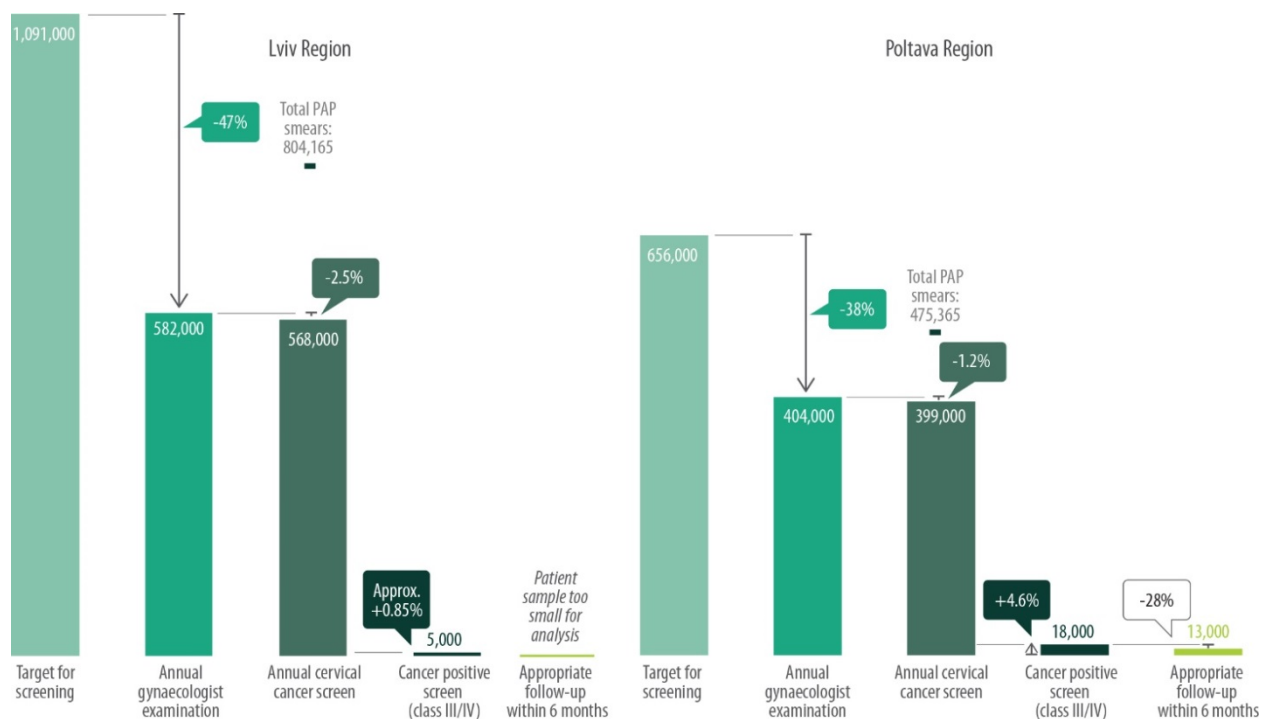
<sup>43</sup> Health Index. Ukraine - 2016. Results of the National Household Survey. <http://health-index.com.ua/files/zvit-index-2016-eng.pdf>

data on smears tested. The total number of smears reported by the cytology lab was higher than the cascade estimation in both regions. This may be because many women have more than one routine smear test per year—32% of Lviv patient cards and 55% of Poltava cards showed a PAP screening interval of less than 1 year. It was encouraging to see in the routine data that at least some of these short screening intervals were due to suspect smears. Among women with a result of ‘atypia’ (class II staging), 57% were rescreened within 12 months and among those with ‘dysplasia’ (class III/IV staging), 78% were rescreened within 12 months. Nevertheless, **44% of women with a normal smear result were rescreened within 12 months, which is not an efficient use of resources.**

### Diagnosis: Important losses to follow-up

With a high number of annual cytological examinations, there is low yield at 0.85% in the Lviv Region and 4.6% in Poltava (it remained unclear why positive yields differed by a factor of 5 between the two regions). The last two cascade columns on suspect screenings and follow-up diagnostic tests were challenging to estimate due to low numbers in the patient card survey in Lviv. In the Poltava region, 28% of women who screened positive did not receive a follow-up appointment within 6 months, such as a pelvic ultrasound or cytology examination. However, almost all women with ‘dysplasia’ (96%) were retested within two years, and most with ‘atypia’ (80%) were also retested within two years.

Figure 7.3: CC screening cascades for 2016 in Lviv and Poltava Regions



Source: Lviv and Poltava regional demographic statistics (target to screen), Health Index Survey 2016, ambulatory care data from women’s consultation units form 025, Lviv cytology report on number of smears.

Note: Estimated numbers are rounded to the nearest 1,000.

**CC cases: In both regions, few young cases, over half ages 40–59 years (54%) and a third ages 60 and above (32%).**

A more in-depth analysis of age patterns and staging results of registered first-time episodes of CC showed that less than 5% of all CC cases were diagnosed in women below 35 years, and very few cases were aged below 30 years.

CC incidence per 100 females was 19.8 in Lviv and 24.1 in Poltava.<sup>44</sup> A more in-depth analysis of age patterns and staging results of registered first-time episodes of CC showed that less than 5% of all CC cases were diagnosed in women below 35 years, and very few cases were aged below 30 years (2% in Lviv, youngest case age 21 years; 1% in Poltava, youngest case age 27 years).<sup>45</sup> In the older age groups, the proportion with stages II–IV cancer was higher, in line with what is expected of a slowly developing pathology. This relates back to the age targeting of CC screening, which, in many country contexts, prioritizes women ages 30–65 years due to best yield and efficiency. Invasive, stage IV cancer was diagnosed at 6% (Lviv) and 4% (Poltava) among all registered CC cases. Stage I cancers were the most frequently

diagnosed in both regions (Figure 7.4).

Figure 7.4: CC cases registered in 2015 to mid-2017 in Lviv and Poltava regions, by age group and cancer stage

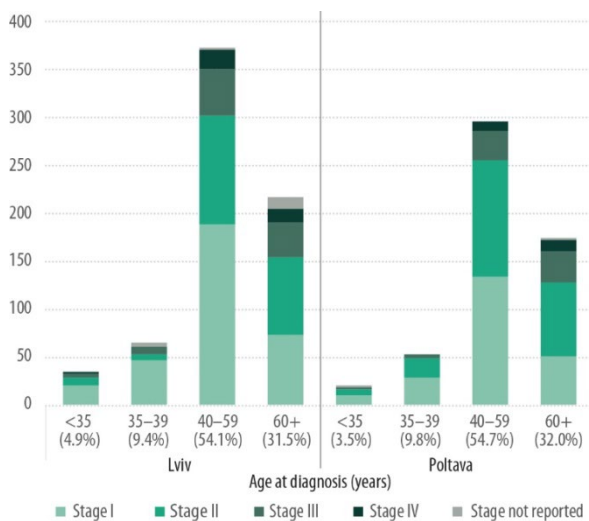
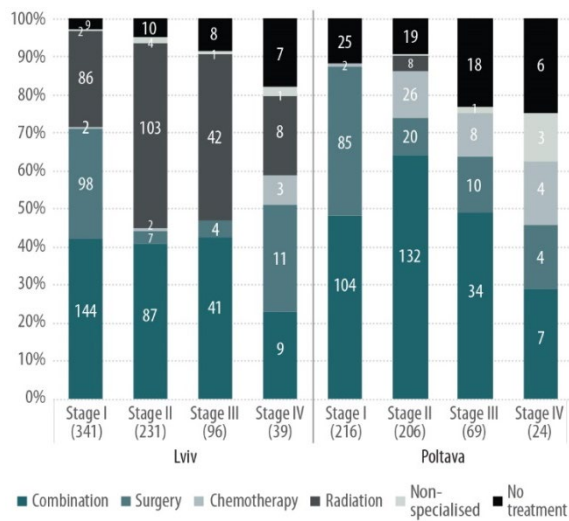


Figure 7.5: Treatment types in Lviv and Poltava regions by cancer stage, 2015 to mid-2017 data



Sources: Cancer registries 2015 to mid-2017 Lviv and Poltava Regions.

<sup>44</sup> Cervical cancer statistics, Bulletin of National Cancer Registry of Ukraine № 19, 2015–2016. [http://www.ncru.inf.ua/publications/BULL\\_19/PDF/46-47%20shm.pdf](http://www.ncru.inf.ua/publications/BULL_19/PDF/46-47%20shm.pdf).

<sup>45</sup> Based on 2015–mid 2017 data of cancer registry.

**Treatment strategies: Both regions have used a combination of treatments in most cases (Figure 7.5).**

.....  
 The oncology team explained that stage I was often only diagnosed after surgery and concurred that time-to-treatment could potentially be reduced from the current 22-day period for stage I cancers with the adoption of simpler treatment approaches.  
 .....

There are differences in treatment strategy and protocol between the two regions, often due to resource availability and capacity. For instance, Lviv used radiation treatment in 34% of cases in all stages, while Poltava used radiation treatment in just 2% of cases and in stage II only. Poltava oncology teams reported that there is a lack of adequate equipment for radiological treatment and patients were referred to Kharkiv region for radiation treatment if necessary.

The average interval between diagnosis and treatment, that is, 'time-to-treatment', was analyzed. During 2015 to mid-2017, the average interval between diagnosis and the start of treatment was 23 days in the Lviv region and 20 days in the Poltava region. The Lviv region started treatment at 22 days after diagnosis for all stages, whereas Poltava started treatment more quickly for more

advanced pathology (for example, 16 days after diagnosis for stage III versus 22 days for stage I). The oncology team explained that stage I was often only diagnosed after surgery and concurred that time-to-treatment could potentially be reduced from the current 22-day period for stage I cancers with the adoption of simpler treatment approaches.

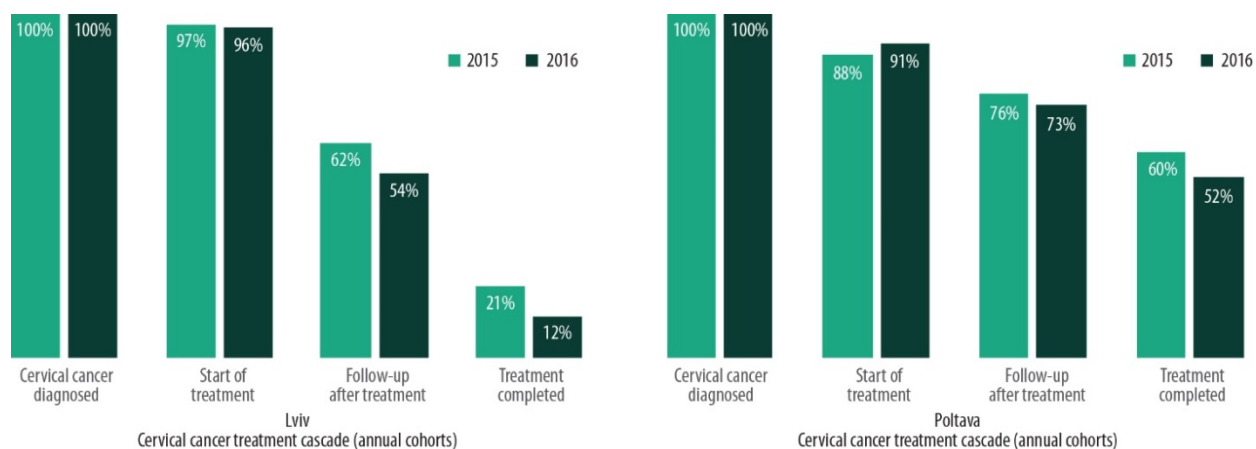
**Treatment cascade: The cancer registry data for 2015–2016 were extracted and analyzed to develop the CC treatment cascades for annual cohorts.**

The treatment cascade defined the following three stages:

1. The percentage of diagnosed CC cases initiated on treatment
2. The percentage of cases with confirmed treatment completion (first episode only)
3. The percentage of cases which had evidence of post-treatment monitoring

Data was analyzed for two annual cohorts, 2015 and 2016, to prevent truncated data due to insufficient follow-up time (data extracted from registries in October 2017) (Figure 7.6).

Figure 7.6: CC treatment cascades in Lviv and Poltava Regions (2015, 2016 cohorts)



Sources: Cancer registries, CC cases newly registered in 2015 and 2016 Lviv and Poltava regions.

In both regions and annual cohorts, a proportion of cases had no record of **treatment initiation** in the cancer registry (Figure 7.6 - for 2015 and 2016, respectively, 3% and 4% in Lviv, 12% and 9% in Poltava). A closer investigation showed that most of these cases had no information on linking to care recorded, whereas a minority had evidence of treatment refusal, out-transfer (changing place of living and health care), or partial treatment. The oncologists indicated that the main reasons for refusals were old age and advanced cancer stages. In several cases, it was difficult to identify the reason for loss to care due to insufficient documentation in the cancer registry in both regions. It was often unclear at what stage of the continuum of CC care a death had occurred.

.....  
The lack of follow-through with patients implies potential concern that women with a CC history may not be systematically recalled for higher-frequency retesting.  
.....

**Treatment completion** data was not thoroughly recorded in the cancer registry annual cohort for 2015 and 2016 (Figure 7.6). In the two years analyzed, 62% and 54% in Lviv lacked data on the status or date of treatment completion and a small number, 4 out of 677, had documented treatment withdrawal. In Poltava, 76% and 73% have no treatment outcome recorded into the 2015/2016 registry, and no data could be found on withdrawal while on treatment.

**Post-treatment monitoring of cases** was in both regions not well tracked and documented in the registry. This was explained by the lack of information from family doctors to flow back to the registry, including patient death. According to the Cancer Bulletin of 2016, however, the five-year survival rate is 70.4%.<sup>46</sup> The lack of follow-through with patients implies potential concern that women with a CC history may not be systematically recalled for higher-frequency retesting.

## Implications for Action

- ▶ The study, conducted in collaboration with the regional oncology teams, demonstrated the **value of analysis** of cancer registry data on strategic key information, such as time-to-treatment, treatment coverage, loss to care, and treatment patterns (each by cancer stage) to guide **quality improvements**.
- ▶ To **initiate cancer treatments without delay**, the oncology teams need to have clear standard procedures, improved pharmaceutical supplies, and access to reliable diagnostic equipment.
- ▶ **Implementation-oriented guidance** on efficient treatment initiation, patient support, and counselling (to minimize refusals, withdrawals, and losses) should be part of the standard protocol for care.
- ▶ **Coordination between levels of CC care**, in particular follow-up monitoring and recording, needs strengthening to ensure long-term patient support and understand **final patient outcomes**. Better data flow to the Cancer Registry Units would improve data on the timing and prevalence of death and eventually provide better estimates of 5-year survival rates. It would also strengthen data on treatment completion and post-treatment monitoring which the local oncology teams deem important.
- ▶ The recently published National Guidance on Cancer Screening needs to be translated into **systems of targeted invitations for screening and patient recall**, bearing in mind individuals' age and risk (Figure 2.6.)
- ▶ A move toward **lower CC screening frequency and better age targeting**, based on the latest MoH guidance and in line with international evidence, is recommended.

<sup>46</sup> Cervical cancer statistics, Bulletin of National Cancer Registry of Ukraine № 19, 2015–2016. [http://www.ncru.inf.ua/publications/BULL\\_19/PDF/46-47%20shm.pdf](http://www.ncru.inf.ua/publications/BULL_19/PDF/46-47%20shm.pdf).

## **Chapter 8: Qualitative Research Results on the Insights of ‘the Care Cascade’ Breakpoints and Policy Implications**

### **Health Care Manager Insights on Breakpoints in Tackling NCDs in Ukraine**

#### **Introduction and objectives**

The NCD cascades analysis is an innovative tool which was not widely applied for NCD care assessment. This tool can be used to describe the key breakpoints in the system and identify gaps in the system that should be fixed. The results from the NCD cascade analyses were presented as policy briefs and discussed with stockholders for their feedback on relevance and actions that the cascades can inform for service delivery improvements in Ukraine.

In October 2018, health care managers from regions of Ukraine were engaged in a targeted qualitative study to evaluate the applicability of findings and readiness to use the results of cascade analysis for implementation of the public health reforms at the regional levels. The study was designed to cover the aspects of health governance (paying special attention to accountability, leadership, transparency, and other specific issues of governance on different levels) (Brinkerhoff and Bossert 2008). The study aimed to record input from health care managers on identified breakpoints and suggested ways to address them. The managers' views and opinions are an important input into decision making (World Bank 2006), and the study team attempted to solicit opinions and document the inputs in a structured way.

The study was conducted during the national-level NCD workshop. Its objectives were to (a) share experiences from two regions on NCD cascade analysis using routine data and learn about findings and recommendations with relevance to the health reform at the primary care level; (b) introduce the national NCD strategy and identify steps for implementation; (c) introduce the approaches and tools for NCD cascade analysis successfully used in the two regions and discuss the data needs, analysis steps, and possible outputs; and (d) discuss how to respond to the identified gaps in the continuum of care.

A wide group of regional experts was engaged in the workshop. The management of health departments of 18 regions, who are responsible for the implementation of health reform at the regional level, and representatives from the National Public Health Center and WHO participated in the event.

#### *The study methods*

For the qualitative study, we employed a multi-methods qualitative approach (Creswell and Plano Clark 2017). It included focus group discussions, semi-structured interviews, and reflections from the workshop presentation and sessions. The feedback was collected to identify lessons learned and challenges for improvement of patient-oriented health care services at the regional level.

### **Overview of Identified Breakpoints in Tackling Four NCDs in Ukraine**

The feedback from the health managers was organized according to the stages of the care continuum for diseases included in the NCD cascade analysis. Table 8.1 presents the summary of areas of concern from the cascade analysis on four NCDs in two pilot regions of Ukraine that were mentioned by the study participants. Overall, participants supported usefulness of the cascade analysis and suggested that cascades be constructed for all regions of Ukraine. The use of cascades was suggested as a useful management tool for prioritization of actions and funding, which can help address gaps and focus reform measures to provide targeted and patient-focused health care.

Table 8.1: Key findings on existing challenges and bottlenecks for 4 NCDs

	<b>Screening</b>	<b>Diagnostics</b>	<b>Treatment</b>	<b>Follow-up</b> (monitoring and long-term care)
<b>HTN</b>	<ul style="list-style-type: none"> <li>Accurate estimates of HTN prevalence are lacking.</li> </ul>	<ul style="list-style-type: none"> <li>Detection of HTN cases is poor in early stages, with more than 60% diagnosed during late stages (3 or 4).</li> </ul>	<ul style="list-style-type: none"> <li>Some delay in beginning of treatment in certain patients</li> <li>Poor documentation and evaluation of non-pharmacological treatment strategies (advice to reduce weight and so on)</li> </ul>	<ul style="list-style-type: none"> <li>There is not enough data on repeat visits (BP measurement and so on).</li> </ul>
<b>Type 2 diabetes</b>	<ul style="list-style-type: none"> <li>Current screening campaigns use positive yield among people reporting no preexisting diabetes. Instead, screening should be targeted to age and BMI/risk categories.</li> </ul>	<ul style="list-style-type: none"> <li>People avoid the diagnosis.</li> </ul>	<ul style="list-style-type: none"> <li>Problems of compliance with the clinical protocol.</li> <li>Patient monitoring and targeted support to patients who struggle with adherence needs to be improved.</li> </ul>	<ul style="list-style-type: none"> <li><i>Challenges for achieving the glucose control target (no record on the results of the tests)</i></li> <li><i>Weak communication links between endocrinologists and family doctors</i></li> </ul>
<b>CC</b>	<ul style="list-style-type: none"> <li>Insufficient coverage (detected during routine professional examination)</li> <li>Possible quality issues with smear microscopy</li> <li>The age group of mandatory screening does not match the prevalence</li> </ul>	<ul style="list-style-type: none"> <li>It is difficult to track the connection between screening and diagnostics.</li> </ul>	<ul style="list-style-type: none"> <li>Incomplete documentation in the cancer registry of treatment start and end and reasons for non-treatment.</li> <li>Poor data flow back to family doctors.</li> <li>Treatment protocols not standardized.</li> <li>Some regions do not have required equipment to make proper treatment on time.</li> </ul>	<ul style="list-style-type: none"> <li>Poor documentation of long-term monitoring of cases, their survival, and their follow-up tests</li> </ul>
<b>BC</b>	<ul style="list-style-type: none"> <li>Not all eligible women are undergoing gynecological examination and not all women undergoing gynecological examinations are also given a breast examination.</li> </ul>	<ul style="list-style-type: none"> <li>It is difficult to track the connection between screening and diagnostics.</li> </ul>	<ul style="list-style-type: none"> <li>Treatment start and end dates incomplete, reasons for non-treatment or non-completion poorly documented</li> </ul>	<ul style="list-style-type: none"> <li>Poor documentation of long-term monitoring of cases, their survival, and their follow-up tests</li> </ul>

Source: Policy briefs with results of cascade analysis on four NCDs in two pilot regions of Ukraine



## Service Delivery (Diagnostics, Information Systems), Including Coverage, Access, and Quality of Care

From the perspective of NCD management and service delivery there are some challenges: the **quality of diagnostics and treatment** is a substantial challenge. There is a big issue with different components of quality, including medical doctors' knowledge and skills, quality of equipment available for diagnostic, treatment, and monitoring, and so on.

*"Family doctors do not have the knowledge and skills to set up screening. Continuous training of professionals is required."*

*"We have bad logistics and equipment. For example, there is not enough glucose meters, ignoring the importance of measuring HBA1C which is not performed systematically in the country because of the high cost."*

A few health care managers expressed critical views on **the quality and effectiveness of diagnostic and treatment approaches**.

*"There is a problem of poor quality of cytological research. An integrated approach is needed, for example, to use two screening methods and to carry out an audit of existing equipment for screening."*

*"We need the endocrinologists to use more modern approaches."*

*"Sometimes, especially in private laboratories, patients receive the results of (diagnostic) analyses in a few hours. However, it takes several days for laboratory results in the state labor PHC laboratory because special equipment for laboratory tests and diagnosis are only available in another city."*

At the same time, health care managers emphasized that it is easier to achieve better NCD when patients take responsibility for their health together with their doctor. In addition, there was an identified need for proper case management, integration of services on all levels, and transparent sharing of information between different levels of health care.

*"What is needed is correct organization of work. How to encourage people to take screening? It is necessary to do it on a routine basis. Also, it is good if this will be done according to the principle of continuity between all the levels."*

*In order to reduce the loss of patients, an "effective monitoring system," "tracking system" is needed. Moreover, for unknown reasons, now "do not pay enough attention to quality assurance and linkage to care."*

Health managers noted that **the system of health care services is fragmented, and patients have to spend a substantial amount of time and resources to get diagnostics and treatment**, resulting in demotivating patients in their care continuum from diagnostics to treatment adherence.

*"Doctors are advising (patients) to undergo a series of tests and diagnostic procedures, but for this purpose it is necessary to visit various health care institutions, which are often far from each other."*

*“There is a lack of regular contact between family doctors and endocrinologists, other narrow specialists.”*

The **low quality of information and issues with screening and treatment data** was identified by health care managers as one of the key challenges in combating NCDs in Ukraine.

*“The problem is the lack of a unified information system and the lack of sufficient information in the healthcare sector. Paper records are torment in our time.”*

*“Approximately 10 years ago there was an attempt to solve this issue in quality data collection, but there was a problem of licensing programs. There should be a single approach under the direction of the Ministry of Health, but the MOH does not do this, the systems are not merged and there is no way to integrate data from different systems.”*

The functional eHealth system was suggested as a **prospective enabler in structuring, integrating, and providing appropriate access to the enormous amount of relevant data regarding NCDs**. However, all registries (for cancer patients, for patients with diabetes who receive insulin, and so on) should be a part of a national database. According to informants, there is an existing problem related to lack of data at the regional level, as data are often available at the national level and the analytics at regional level is underdeveloped. Moreover, there is no reliable data for strategic information and no verification system for the data, to understand things like patient adherence patterns and estimate the screening participation rate for different screening programs. Overall, this makes it difficult to justify the regional health agenda.

*“The challenge now is how to outline the estimated number of patients, to make predictions on amount of diagnosis, treatment and monitoring and follow-up.”*

Technological challenges related to information and data exchange systems, limited possibilities for follow-up, and insufficient quality and efficiency of diagnostics and treatment due to outdated equipment and methods were mentioned by health care managers as key obstacles for effectively tackling key NCDs in Ukraine.

## **Health Financing (Overall Financing, Domestic Resource Mobilization, Out of Pocket Spending)**

Focus groups and semi-structured interviews conducted during the workshop point to **the dependence of the NCD screening programs on the availability of regional finances**. To date, the programs for screening and diagnostics are financed through the regional budget. The availability of funding is related to the priorities set up by the regional Departments of Health operating within limited resources.

*“Different Regions themselves compiled their screening programs for various available funds.”*

*“Available limited financial resources are allocated to closing the holes from which people die today, for example, purchasing defibrillators, equipment for reducing the mortality rate from myocardial infarction, work with an injury, road accidents, urgent pathologies, etc., so-called, global black holes in the healthcare sector.”*

Some participants shared positive experiences from their regions, for example, vaccinations for CC taking place at the expense of a city budget program and expressed the opinion that the prevention of NCDs has to be a priority.

The cascade analysis raised questions of cost-effectiveness and efficiency of the current screening, diagnostic, and intervention policies and practice in Ukraine.

*“Is it economically feasible to screen for CC starting at age 18? Although this disease is younger, yet it is more common among older women. Perhaps it makes sense to do more modern diagnosis, but with fewer women.”*

**Financial burden related to NCDs is an issue for families as an important factor for breakpoints in the continuum of care.** Some gaps in the cascades were related to access to medicines or treatment. The treatment costs are often too high for patients. In some cases, the patient starts treatment and then the family has no resources to continue this treatment, since both drugs and repeated diagnostic procedures require funds that people simply do not have.

Economic incentives were also mentioned as possible motivation factors for service providers. Performance-based incentives for family doctors for early disease detection and early screening could motivate them for appropriate screening and follow-up.

*“Motivation issues for health workers, financial motivation one of the most effective method of encouraging employees.”*

In the view of health care managers, **labor migration has negative impacts on service delivery.** The low wages of medical personnel lead to the outflow of qualified and skilled personnel abroad. Labor migration of general population also complicates health monitoring.

*“The problem of screening, which is especially relevant for the western regions, is related to the issues of mass migration abroad for employment. For example, a woman undergoes an examination, she has signs of a certain disease, suppose hypertension, but she no longer appears to a doctor because she goes abroad (for employment), or if she has a certain disease, she appears to a doctor ad hoc, only when she is in Ukraine.”*

In summary, the financing challenges for better management of NCDs in Ukraine could include (a) insufficient financing of the health system (issues of funding for medical facilities and health programs) or (b) overall economic conditions in the country (economic well-being of population, labor market, challenging macroeconomic situation, and so on).

**Institutional arrangements including the roles and responsibilities of national vs regional levels, legislative, regulatory and governance structures:**

In the view of health care managers, **at the primary care level, family doctors lack clear understanding of their responsibility for screening and follow-up of patients NCDs and often do not proactively conduct outreach for the recommended follow-up visits.**

*“It is not clear how the question of screening is integrated into the primary care. Consequently, there are no clear recommendations, knowledge and skills in order to establish screening at the primary level.”*

*“Monitoring is a task for family medicine, but now there is no clear, prescribed bilateral obligation between the patient and the physician.”*

*“No one is really responsible to follow-up patients, to check the situation.”*

Most health managers viewed **challenges to use modern standards and protocols in dealing with NCDs in the country**. According to the feedback of participants, **protocols are needed, but the appropriate legislation framework is also needed**. Therefore, medical specialists face challenges because “there are no single accepted rules of the game,” which are expected from the MoH.

*“The current situation is imbalanced. It’s easier to work when there is a clear regulatory framework and clear protocols.”*

It was suggested that the administrators and service providers would appreciate more precise guidance on what should be done and in which sequence for improvements of service delivery, ideally formulated in the form of a legally approved protocol. However, respondents also noted that providers do not always adhere to protocols even when they exist.

*“There is a problem with national clinical protocols: the protocol for hypertension is outdated, there is the MOH’s position regarding the use of international recommendations, and facility personnel do not understand how to use it.”*

Participants of the study mostly agreed to the need to address the problems of protocols, in particular, the adaptation of international protocols and the updating of existing protocols. The absence of clear guidelines seems to make the enforcement and monitoring of clinical work difficult at the management level.

*“There are no functions of influence on the primary care and quite soon they will be absent in the secondary care.”*

*“There are problems of hospital districts, and coordination between different health facilities, control of patient pathway.”*

The newly established public health centers were suggested as appropriate institutions for health promotion and communication with the population on risk factors and lifestyle, as well as screening and follow-up. To date, according to health care managers, there are **no clear responsibilities for health communication with the population at the regional level**.

*“We feel the lack of organizational and structural units that would deal with communicating with the population, doctors, and patients. Such a unit should also be involved in the development and implementation of preventive measures aimed at people at risk, thoughtful measures, not just information measures.”*

Consequently, the issues of leadership, responsibilities and accountability, guidelines from the MoH, availability of international and national standards, and mechanisms to monitor and ensure compliance with these standards were identified as factors contributing to the identified breakpoints in the continuum of care for key NCDs in Ukraine.

## **Socio-Cultural Factors, Including Awareness**

While discussing the differences between prevalence and treatment coverage for the NCDs in regions, participants mentioned numerous social factors such as the **urbanization, employment, and accessibility of health care providers**.

A common problem mentioned by study participants from regions is **low awareness of the population about NCD prevention and management and their low interest in staying healthy**.

*“There are issues of realignment the health agenda at the national level from the treatment policy to the prevention policy. And such a policy should also be rebuilt at the regional level. Departments are now dealing with the consequences of abnormal behavior of the population, so as long as there is no policy of promoting a healthy lifestyle, the negative results of the cascade analysis will not disappear.”*

Another factor for breakpoints in the continuum of care is **insufficient skills for effective communication about healthy lifestyle** and lack of skills and time for family doctors to talk with patients about healthy behaviors.

*“Medical staff should talk with patients about the body mass index, explain the dangers. See, in one of the villages, the paramedics spoke about healthy eating, and people began to grow more cabbage, changed certain eating habits.”*

*“It is important to build with patients conscious understanding of the diagnosis, which allows the patient to make decisions and understand the threats (especially this applies to the appropriate treatment). Also, important involve a psychologist at this stage as far FD could not provide psychosocial support where it is needed.”*

However, some participants were rather skeptical toward health promotion activities to reduce morbidity and mortality from NCDs.

*“Reorganization, changes of consciousness take several generations. It is now important to understand that the mentality of the population is complex, and it is not easy to change it. Over the next few decades, the country's population will continue to consume products that it has consumed for centuries, and alcohol will not disappear from the diet of Ukrainians. As an example, no anti-alcohol campaign has yielded results, and in the case of further increases in alcohol prices, the population will begin to use low-quality alcohol, which will be produced informally.”*

Social and cultural factors affecting the breakpoints in the continuum of care for key NCDs in Ukraine are quite broad – starting from awareness about NCDs and their risk factors, attitudes toward health and lifestyle choices among the population, and communication between patients and medical doctors. Preventive care does not seem to be prioritized, and there is a lack of awareness-raising campaigns and a lack of training/incentives for doctors to participate in health promotion activities.

## **A Way Forward: Possible Next Steps in Overcoming Bottlenecks**

In the view of health managers, a wide range of overlapping issues and factors influence the breakpoints in the continuum of care for NCDs in Ukraine. We also asked about the enabling factors to improve the current situation with NCD epidemic in Ukraine at different levels of the system.

A majority of informants insisted that the national-level authorities need to take a more active role in addressing existing health problems. The participants suggested that the **international standards (clinical protocols) that introduce modern approaches to diagnostics, treatment, and monitoring of NCDs** need to be proposed, and their implementation should be supervised.

Participants expected from the MoH **a leadership role in solving the problem of integrating various information databases and registries**, which contain information about the risk factors present in patients, the results of diagnosis, and treatment. It is advisable to have tools that allow the patient to be informed about the need for a reexamination, a visit to a doctor, and so on in the integrated database. The electronic prescriptions for drugs, especially for free drugs, should become an integral part of the eHealth system and the electronic card of a patient. It will be valuable if the newly established National Health Service controls all money flows in the primary, secondary, and tertiary care. Ultimately, a robust and extensive data management infrastructure that contains individual patient information should be set up.

**The existing best practices in tackling NCDs should inform comprehensive action plan** ('a road map' for introducing preventive, personalized, and participatory medicine) with the targeted primary or secondary outcomes. Some informants argued that one step toward improving the situation could be an initiative of sharing of best practices in policy development in European countries and what may be applicable or helpful in the Ukrainian context.

*"Each cascade analysis data show that there are problems with certain indicators. It is necessity to look what had been done in Europe (selected "successful" countries) according to this indicator for each column of the cascade. So, there will be a vision of the structure of further work based on the European example. After that, an analysis of available resources, a list of what is missing, and the involvement of donors as a World Bank should be carried out to implement the above-mentioned actions to close the gaps."*

*"Perhaps it is worth to use the experience of the Khmelnytsky region, where family doctors receive financial incentives for early detection of cancer."*

*"The positive experience of drug reimbursement should be learnt and expand."*

Health care managers recognized that shifting resources toward NCD prevention is a difficult process, even if the human cost of these diseases is massive and increasing. However, health care managers suggested that **issues of screening for NCDs should become a priority in national and regional agenda.**

- The relevant legal regulations should be adopted, including responsibilities of the family doctors and revision of population groups to be screened (for example, the age for CC screening).
- The complex regional and local screening centers should be established.
- The regions should be more responsible for coordinating screening and diagnostic procedures and be more active in conducting cascade analysis for NCDs, identifying breakpoints, and addressing them.

*"Regions are implementers of state policy. It is important to overcome inaction in this matter. The cascading method is a good tool for understanding the ultimate role of public health."*

**Medical doctors, nurses, and patients need more information and training regarding risk factors of NCDs and relevant care.**

- The medical staff, especially family doctors should be trained and retrained on the issues of screening, treatment, and follow-up with patients, including traditional (phone, postal messages) and modern approaches to work with the targeted population.
- More information is needed about NCDs for the public. Public health interventions could harness techniques from social marketing such as audience segmentation, intervention branding, and well-tested empowering communication campaigns.

A majority of workshop participants also viewed the **engagement and collaboration with stakeholders in NCD planning and development** of activities as potentially beneficial for tackling NCDs in Ukraine.

- Policy measures to achieve healthy diet and healthy lifestyle will require constructively engaging a wider range of stakeholders, in particular the local food industry, retail, the catering sector, school administrations, and educational departments.

- Health promotional programs should be based on intersectoral interaction with proactive civil society organizations.
- Awareness campaigns are a crucial need for doctors and patients.
- There should be a system of social and psychological support for those seeking help (with the involvement of civic organizations and social services), and such a system will help avoid accompanying pathologies.
- International donors could provide technical assistance, supporting implementation, building national capacity, and monitoring progress.

In summary, strong policy leadership of the MoH and evidence-based approaches in the development and deployment of public health policy and communication were identified as priority targets for future policy planning in combating NCDs in Ukraine. Health care managers further emphasized the need to scale up interventions and develop integrated policies that address various risk factors for NCD prevention and treatment through multi-stakeholder collaboration and cross-sector involvement.

## Chapter 9: Conclusion

The disease-specific chapters 4-7 present implications for action regarding improved programs for hypertension, diabetes, breast cancer and cervical cancer. In addition, Chapter 8 discusses the insights gained from health managers on how bottlenecks in care delivery can be overcome. Here, we provide some overall concluding remarks.

Ukraine's approach to addressing NCDs throughout the country needs a paradigm shift, one that focuses more on health prevention and promotion rather than curative services. A comprehensive approach to target the NCD burden is relatively nonexistent despite alarming rates of premature death linked to these diseases. While the Government of Ukraine has made recent progress in highlighting the NCD burden as a priority through current health reform initiatives, in particular related to the creation of a public health system, this progress has yet to be realized in a way that affects service delivery. A comprehensive approach should support continued governmental priorities (that is, creation and integration of standards and protocols, appropriate screening programs, effective data systems and enhanced public health and medical training for service providers, and so on). At the same time, effective regional and community-based efforts are needed to implement programs, enhance patient services, and provide mechanisms to bolster preventive care focused on increasing health and wellness among the population.

The burden of NCDs in Ukraine is very high. Progress has been initiated, but the long-term impact of the NCD burden on disability and premature deaths is only just unfolding. Ukraine can leverage its current political climate and citizen demand for reform in this area to address some of the most pressing NCD problems affecting the health of the nation. Although Ukraine's unique health challenges point to the need for tailoring new programs specifically to the Ukraine context, as the report demonstrates, there is a wide knowledge base of international best practices and norms to inform screening activities, prevention and promotion, intervention targeting, and cost-effective approaches.

### **The Government of Ukraine can focus on specific policy areas to bolster its continued progress in addressing NCDs.**

First, there should be continued efforts to maintain and grow progress in PHC reform. The PHC reform is focused on creating patient-centered and comprehensive care, and there is ample opportunity to integrate more activities specifically related to the prevention and management of NCDs at the PHC level. The current capacity of the PHC level to appropriately screen for and treat NCDs is not adequate. There is a lack of resources for adequately trained health care staff, modern equipment, and appropriate medication. Available resources and budgets vary greatly between regions. There is an urgent need for comprehensive standards and evidence-based protocols for the screening, treatment, and management of specific conditions. For diseases that have an existing treatment protocol in place, adherence to that protocol is questionable. As part of the reform, a more efficient and cost-effective health system is being developed. It must focus on creating evidence-based and cost-effective screening programs while simultaneously bolstering the capacity of the PHC level to adequately meet standards of care. Strong case finding programs are essential to identify health issues, however, linkage to care after screening is fundamental in order to have an impact on disease outcomes. The PHC-level should be guided by clear screening and treatment protocols, and have strong capacity to treat diseases and address risk factors such as elevated BP. Equally, it should also have appropriate systems of monitoring and supporting patients to reach treatment targets and disease control. In terms of capacity for treatment, staff availability and knowledge, reliable medical equipment, and adequate financial resources should be assessed.

Second, efforts should be made to ensure public health initiatives are reflected in the health budget. The nation should focus on appropriate financing mechanisms that will be linked to PHC involvement in NCD control initiatives. As part of the ongoing reform efforts, the increasing resource base, through a taxation-based health system and regulated user fees for specialized care, is an essential element to a better health system. There should be efforts to increase health expenditure per capita while, at the same time, ensuring that such expenditure is being used more effectively.



Third, there should be policy dialogue on creating and aligning public health roles at the regional and national levels. For instance, with the current health reform, regions have gained autonomy in health spending, but there are gaps in regional versus national priorities, which should be aligned to better meet the objectives of increasing efficiency and quality of care overall while also bolstering community-level prevention activities (that is, screening, prevention, and treatment programs).

Fourth, targeted efforts to increase quality of services and affordability of care should be a priority. Integrated, coordinated care is lacking. The health system in Ukraine is centralized and fragmented, with little communication between care providers regarding a patient's treatment. Closing gaps between breaks in communication between care providers can be used to strengthen coordination of care. Patient data should be easily transferred between specialty- and PHC-level care, particularly as Ukraine aims to strengthen the PHC level as a whole. Coordination of care can also be bolstered through adequate record keeping and coordinated systems to enhance patient follow-up and monitoring of drug and treatment adherence.

A number of issues have been identified related to screening for diseases, including weak or lacking protocols for screening programs, inadequate follow-up of screening outcomes, insufficient quality of screening methods, and inefficient targeting of screening efforts. Screening protocols in Ukraine should be based on principles of yield and efficiency and prioritize higher-risk individuals. There is a need to focus on directing invitations for screening services, and analysis of uptake as well as reasons for non-uptake. The protocols can draw on evidence from international best practice but should be tailored to the Ukraine context, with consideration of the local resource availability as well as the epidemiological pattern of the respective NCDs. Screening programs should include clear guidance on criteria for screening target groups and risk factor assessment and should have standards for timely follow-up to ensure treatment onset is prompt. Once developed, screening protocols should be well introduced and disseminated at the levels of care to which they apply. There is a need to bolster data systems to support the success of screening programs, including invitation management, reminders, and referral mechanisms. The success of screening programs will also rely on mobilization of the target screening population, therefore supporting the need for communication and demand creation efforts to increase uptake of a screening program.

Data management and in-depth record keeping on a patient's treatment through the continuum of care was found to be deficient, particularly to document negative outcomes. At the time of the assessment, record keeping had not yet been switched to the integrated and collaborative EMR system across the country. Also, robust data to track disease prevalence, disease outcomes and treatment methods remained weak. The cascade analyses showed the value in analyzing routine medical record data as well as triangulating data across multiple data sources, which is beneficial for Ukraine to (a) identify breakpoints in care for priority disease areas, (b) begin building a strong evidence/data base for disease-related statistics, (c) tailor national strategies and protocols to the actual situation, and (d) use valuable data to inform education and messaging efforts related to NCDs. Moving forward, continued analyses should be conducted across regions to monitor breakpoints in care for priority diseases and track impact on patient outcomes. Population-level data should be collected regularly at both national and local levels, which can be used for evaluation and target-setting.

Patient education, particularly regarding non-pharmaceutical interventions, is poor. It is not standard practice for care providers to educate patients on their diseases and health conditions, their risk factors, or required changes for healthy lifestyles. There is a lack of targeted approaches for those patients struggling to adhere to non-pharmacological and pharmacological treatment as well as a lack of communication between care providers and patients about strategies for managing disease and improving disease outcomes. There should be a combined approach to monitoring efforts from care providers and patients doing self-monitoring. Initiatives for self-monitoring and treatment adherence can greatly enhance a patient's progress toward disease control, and patients can take advantage of a number of non-pharmacological interventions to support their medical treatment. Specific efforts and programs can be put in place to address the cost of ongoing treatment; patient education/knowledge of the disease; and patient psychological, behavioral, and medical barriers to treatment adherence.

The cost burden of health care for patients is high, particularly for the cost of medications. Cascade analysis results and focus group discussions, corroborated with findings from the 2017 Health Index Survey, indicate a high burden of cost to patients. The poor affordability of medications potentially leads to deterrence in patients seeking care or adhering to medication regimens. Ukraine has already started to address this issue with the adoption of a list of guaranteed covered services as well as an affordable medication program for specific priority diseases. Careful monitoring of this program will be beneficial to assess its impact on patient willingness to seek diagnosis and adhere to treatment. In addition, information gathered may be useful to advocate for schemes that protect patients from excessive costs particularly for chronic diseases and lead to healthier and more productive lives.

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Ukraine is in the midst of a comprehensive health sector reform to transform the current unaffordable and inefficient system into a modern, more efficient, and affordable one. The country's health system is not addressing non-communicable diseases (NCD) and chronic conditions effectively, and NCD-related health outcomes compare relatively poorly to countries with a similar level of health financing. The paper analyzed the continuum of care for four conditions (hypertension, diabetes, breast, and cervical cancer) using the cascade framework as an analytical tool and programmatic data from two regions of Ukraine (Lviv and Poltava). It draws on global evidence of good and cost-efficient practices and includes the findings from guided discussions with Ukrainian health care planners, administrators, and providers.

The analysis found significant gaps in detection, treatment monitoring, and treatment adherence in hypertension care (the largest breakpoints were blood pressure monitoring and achieving treatment targets) and similarly in diabetes care (underdiagnosis, inappropriate or incomplete treatment monitoring, sub-optimal treatment success). In breast cancer care, there was inadequate screening coverage among eligible women, post-screening losses, and a lack of documentation regarding treatment outcomes. In cervical cancer care, the screening intervals for covered women were short, creating inefficiencies, while many women were not screened despite program eligibility, and there was also a lack of long-term monitoring of women who had undergone treatment.

The authors discuss the methodological approach of analyzing routine medical records and cancer registry data and triangulating data across multiple data sources. Important lessons and policy implications include the need to revise sequence of services, focus on follow up and retention in care, develop systems for managing risk factors, and strengthen the monitoring and data recording of NCD cases. Improved NCD care would save lives, reduce disability, save resources in health care, and reduce the impact of NCDs on individuals and society.

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