Research on policy developments and effective measures directed towards reduction of nutrition related non-communicable diseases in the CIS countries.

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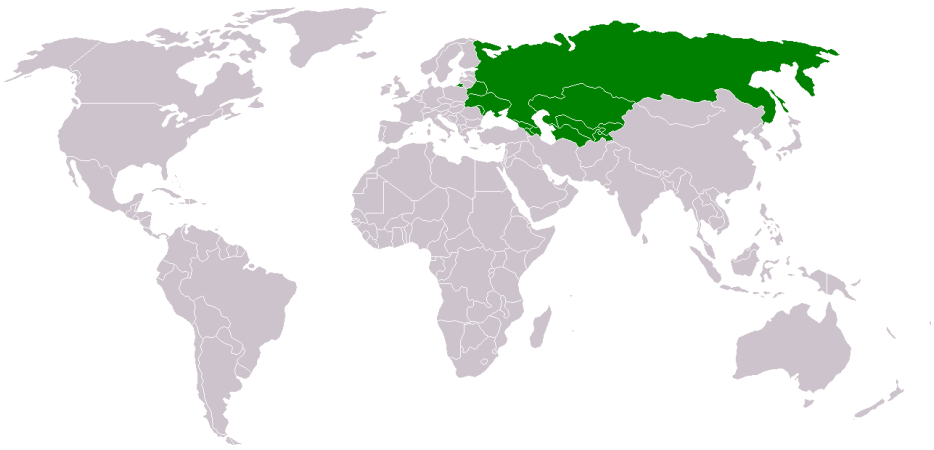

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by

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Acronyms

BMI	Body Mass Index
CIS	Commonwealth of Independent States
CVD	Cardiovascular Diseases
E%	Percentage of energy from total dietary intake
FFA	Framework for action
GAP	Global Action Plan
GINA	Global database for Implementation of Nutrition Action
ICN2	Second International Conference on Nutrition
NCD's	Non-communicable diseases
NOPA	Nutrition, Obesity and Physical Activity database
PM	Premature mortality
UN	United Nations
WHA	World health Assembly
WHO	World health Organization

Executive Summary

Prevalence of non-communicable diseases (NCD) in the Commonwealth of Independent States (CIS) is high and on the increase, causing associated socioeconomic burden from premature mortality and disability.

Methods
Our research aimed to outline a nutrition policy framework for the CIS that targets NCD reduction. We have searched for international policy recommendations; measured prevalence of risk factors in the CIS; studied (cost) effective and evidence-based policy measures; researched availability of those measures in the policies; and outlined a framework that should guide nutrition policy development.

Results
Search for international recommendations on development of nutrition policies showed that progress is made in provision of policy guidelines and indication of nutritional risk factors (salt, sugar, fat, fruits and vegetables, breastfeeding, marketing).
Country data research found that CIS should improve surveillance on fat consumption and childhood obesity and continue to monitor other risk factors. The literature search indicated available cost-effective policy measures.
Policy search showed availability of nutrition policy measures in the CIS. Progress is observed in development of integrated national policies that target NCD reduction with nutritional measures. However, assessed policies showed limited inclusion of risk factors.
Based on our findings we provided a framework for the CIS governments that guides nutrition policy formulation and indicates prioritized measures.

Conclusion
Evidence shows progress in development of international policy recommendations that target nutritional risk factors and progress in researching cost-effective measures. CIS committed to implement this knowledge, however limited evidence was found on availability of policies that encounter all relevant risk factors.

KEY WORDS : policy, nutrition, diet, Commonwealth of Independent States (CIS), non-communicable diseases (NCD's).

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1. Background

In the period of 2000-2012 the burden of global premature mortality and disability has shifted towards non-communicable diseases (NCDs) and this number is expected to rise further (Lim et al. 2012; WHO 2013a; UNSCN 2013; WHO 2014c,d). As we compare 2011 and 2014 (Table 1), we see that more than 59% of all deaths in the Commonwealth of Independent States (CIS) can be attributed to the NCDs and that this mortality has increased (WHO 2011c; 2014a). Table 1 also shows that the probability of premature mortality (dying before the age of 70 years) from NCDs (PM) in 2012 is estimated between 20 and 40 percent in the CIS (WHO 2014d).

Table 1 Mortality and probability of premature mortality from NCD (in %) across CIS countries

	NCD		PM %
	2011	2014	2012
Armenia	90	92	29.7
Azerbaijan	85	84	23.3
Republic of Belarus	87	89	26.2
Georgia	91	93	21.6
Kazakhstan	78	84	33.9
Kyrgyzstan	77	80	28.5
Republic of Moldova	87	89	26.5
Russian Federation	82	86	29.9
Tajikistan	59	62	28.8
Turkmenistan	73	76	40.8
Ukraine	86	90	28.2
Uzbekistan	79	79	31.0

Premature mortality or living with a NCD has socioeconomic consequences (Bloom et al. 2011; WHO 2014c). That burden arises because NCDs are mainly chronic conditions and require a life-course approach, attention to disability and therefore rise in health care costs (Bowman et al. 2004; Bloom et al. 2011; Rolfes et al. 2006). Increase in direct health care costs and early retirement caused by NCDs can lead to poverty, as well as to increase in social burden from absenteeism from school or work, decreased productivity and employee turnover (Bloom et al. 2011; WHO 2006b). Data shows that premature mortality and associated burden from NCD mainly occurs in middle-income countries and as table 1 showed, specifically in the most CIS countries (Bloom et. Al. 2011; WHO 2008b; 2010c; 2014d). During 2011–2025, cumulative economic losses due to lost productivity from NCDs in low- and middle-income countries is estimated at US$ 7 trillion (WHO 2014d; ICN2 2014). That socioeconomic loss acts as an important barrier to poverty reduction and sustainable development (WHO 2014d). Ageing population and related rise in life expectancy are also associated with rise in NCD and forth flowing need for measures that will reduce associated burden (Bloom et al 2011; Lim et al. 2012).

Table 2 shows that in 2013 the CIS countries could be attributed to low or middle income group, except for Russian Federation, and that life expectancy has been rising in all CIS countries (The World Bank 2014; WHO 2014b). This emphasizes the relevance of this issue and the need for taking action directed towards NCD reduction, specifically in the CIS.

Table 2 Socio-economic situation (life expectancy and income classification) in the CIS

	Life expectancy in years		Income group
	2009	2012	2013
Armenia	67	71	Lower middle
Azerbaijan	63	72	Upper middle
Republic of Belarus	71	72	Upper middle
Georgia	71	74	Lower middle
Kazakhstan	66	68	Upper middle
Kyrgyzstan	66	69	Lower middle
Republic of Moldova	68	71	Lower middle
Russian Federation	69	69	High
Tajikistan	64	68	Low
Turkmenistan	62	63	Upper middle
Ukraine	70	71	Lower middle
Uzbekistan	67	69	Lower middle

Taking measures

Premature mortality and disability from NCD are largely preventable and avoidable by taking effective actions that target key behavioral risk factors (Bloom et al. 2011; WHO 2010c; 2013e; 2014c; UNSCN 2013). Common preventable risk factor of NCD is an unhealthy nutrition pattern, that can lead to metabolic and physiological changes (Heine et al. 2004; Bowman et al. 2004; Lim et al. 2012; Rolfes et al. 2006; WHO 2004; 2014d; Wolf and Colditz 1998). Those changes cause development and progression of various NCDs and taking cost-effective measures can in contrary help to prevent some NCDs, complications and associated burden (Bowman et al. 2004; Heine et al. 2004; Lim et al. 2012; Rolfes et al. 2006; WHO 2014d).

Primary prevention, such as creating a favorable social and policy environments show to be more effective (and cost-effective) than treating NCDs. Evidence also shows, that high rates of death and disease, particularly in low- and middle-income countries, reflect inadequate investment in cost-effective NCD interventions and that countries should prioritize implementation of very cost-effective policies (Brownell et. al. 2009; National Commission on Prevention Priorities 2007; WHO 2014d; Woolf 2009). Influencing policies that focus on combating risk factors, specific policy formulations and their accurate implementation have already shown to be effective in reducing public health problems, also when it comes to NCD reduction (Bloom et al. 2011; Browson 2010; CDC 1999; Cecchini M. et. al. 2010; WHO 2010b; 2013a,d; UNSCN 2013). This suggests that CIS economies could benefit from implementation of effective nutrition policy options that specifically target reduction of current and potentially increasing burden from NCDs.

2. Methods

Problem Statement: Socio-economic burden and premature mortality from NCDs in the CIS could increase in the future, what indicates the need for implementation of effective measures that target NCD risk factors like unhealthy diet. Implementation of policy measures have shown to be effective in prevention and control of NCDs in the past. Therefore, researching availability and inclusion of effective policy measures that target nutritional aspect of NCD reduction could benefit CIS in addressing this problem.

2.1 Justification

The composition of human diets has changed with globalization, making processed foods high in sugar, salt and fats often chapter and more available than natural foods (Hawkes, 2006; Lieberman, 2003; WHO 2002a). Most of those possessed foods have advantages of being ready to consume and portable, what provides commercial benefits and suits modern society (Monteiro CA 2011). Increase in processed food availability is associated with increase in obesity and other diet-related NCDs (Monteiro CA 2011; Stuckler D 2012; WHO 2010c). The shift toward a more sedentary lifestyle and the shift from agricultural to service-based economies also lead to the spread of fast food culture and associated increase in bodyweight (Cecchini M. et. al. 2010; Hawkes 2006;). Because of saturated markets in the high income counties, future profits from the sale of unhealthy and processed foods and drinks are predicted in the emerging markets of low- and middle-income countries, like countries of the CIS region (Moodie R et. al. 2013; Stuckler D 2012; WHO 2010c). Moodie et. al., indicates that increased consumption of unhealthy foods is already recorded in those countries and that public regulation and market intervention are the only evidence-based mechanisms to prevent harm caused by the unhealthy commodity industries (2013). Political commitments, leadership, establishment of monitoring system, provision of policies and relevant legislations are important in achieving results in NCD reduction (Beaglehole R et. al. 2011). Cost-effective nutritional interventions are therefore specifically advised for introduction into polices of low-income and middle-income countries (Cecchini M. et. al. 2010).

Some progress is already made in the provision of international policy recommendations, scaling up prevalence of diet related NCDs and indication of present policies (WHO 2008b; 2013f; 2014a,c). However, no research is available on the impact of most common diet related NCD risk factors in the CIS, nor evidence is found that suggests prioritized evidence-based and cost-effective policy measures for this region. The data on completeness of nutritional policy options in available national policies of the CIS is also not complete. This suggest that context specific research on impact of nutritional risk factors, most effective policy measures and availability of these measures in current policies could contribute to understanding of the current dietary NCD burden in the CIS and guide potential policy formulations.

2.2 Study Objectives

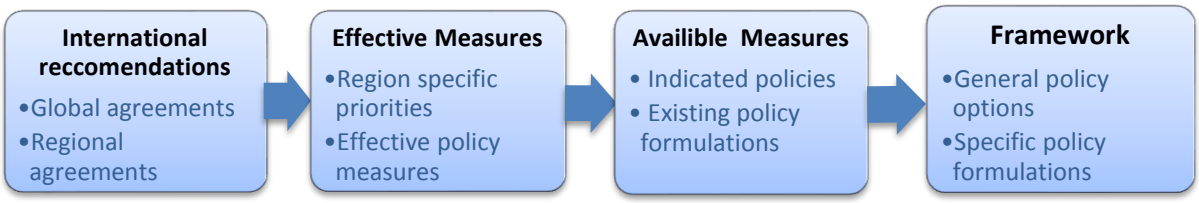
General Objective: To outline a nutrition policy framework for the CIS that targets NCD reduction, based on research of international recommendations, risk factor prevalence in the CIS, evidence- based policy measures and assessment of available policy documents.

Objective 1: To indicate global and regional recommendations directed towards NCD reduction with nutrition policy interventions.
Objective 2: To indicate effective policy measures that target diet related NCDs and are relevant for the CIS.
Objective 3: To look into the availability of indicated measures in CIS policies.
Objective 4: To outline a framework for the development of effective nutrition policies for the CIS.
Objective 5: To provide recommendations for the CIS that aim to improve nutrition policy formulation by the governments.

2.3 Research framework

Figure 1 visualizes our research framework. Chapter 3.1, on international recommendations towards NCD reduction with dietary measures, states the results from assessment of global and regional recommendations and frameworks for nutrition policy formulation. Chapter 3.2, on effective policy measures, presents the statistical impact of selected risk factors in the CIS and evidence from literature that supports priority agreements on policy measures. Chapter 3.3, on the availability of nutrition policy measures in the CIS, shows the results of a systematic search for enforced nutrition policies in the CIS and the assessment of existing policy options. Chapter 3.4, on providing a nutrition policy framework for the CIS, suggests nutrition policy options, specifically recommended for the CIS, based on findings in previous chapters.

Figure 1 Research Framework



International recommendations for NCD reduction with dietary measures

We have applied a systematic search on the internet to identify existing global and regional agreements towards NCD reduction through nutrition policy interventions. We have searched for the UN General Assembly and the World Health Assembly (WHA) resolutions, agreements resulted from regional meetings, global and regional advisory reports and frameworks that were enforced since 2000. Our timeframe was based on the indication that the initiation of first global NCD policy framework was started in 2000 (WHO 2000). The search was limited to documents that state nutritional policy measures for NCD reduction. Found documents were assessed and recommendations for nutritional policy actions are further studied in the literature review (chapter 3.2).

Effective measures

Based on recommended policy measures found in chapter 3.1 we have identified key nutritional risk factors and policy interventions that are relevant for NCD reduction and are recognized by the twelve CIS governments. The assessed countries included Armenia, Azerbaijan, Republic of Belarus, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan (WTO 2011). To assess the relevance of these risk factors and prioritized policy options for our region specific nutrition policy framework, we have searched quantitative data on risk factor contribution to NCDs prevalence in the CIS and evidence from literature that indicates most effective and cost-effective practices. Global reports, national statistical committees, topic specific reports, country websites and databases were assessed to collect statistical evidence. A literature search was preformed to indicate most effective and cost-effective measures specifically for CIS and/or low- and middle- income countries. For our literature search PubMed, topic specific study books, scientific databases (WHO global health observatory, UNICEF DevInfo) and journals (American journal of public health, BMJ, Public Health journal, The Lancet) were assessed. Secondary database Chartbin was used if no data on risk factor impact in the CIS was found from primary sources. The following key terms are used separately or in combination in English and Russian and with addition of country name: Commonwealth of Independent States (CIS), breastfeeding, beverages, child, diet, fat, food, fruit and vegetable, health, hypertension, hypercholesterolemia, promotion, mortality, marketing, Non-communicable diseases (NCD), nutrition, overweight, obesity, policy, salt, sugar.

Availability of nutrition policy measures in the CIS

To measure the current availability of nutrition policies in the CIS, we have identified policy documents relevant to nutrition introduced by the CIS. Our search was applied in English and Russian. First a systematic search was applied on health, agriculture and governmental websites of the CIS countries to identify the availability of NCD and Health policies that state

nutritional section and separate national nutritional policies, relevant legislations and topic specific policies. For the countries that have websites of national nutrition institutions available, those were also assessed. Websites of governmental organizations that regulate sanitary and hygiene standards and social affairs ministries were assessed for the countries where no nutritional institutions are indicated or limited results are found in our document search. If no full document were found for public access, the mentioning of policy existence was recorded. For countries where additional search was acquired CIS legislation database Spinform.ru was assessed to find policy documents or plans for their development. Additionally, a general search on Google.com and Yandex.ru search engines was applied to find the mentioning of policies from secondary (nongovernmental) sources. Our baseline for the national policy documents identification was set at 2008, because that was the adaptation year of the first global NCD reduction strategy (WHO 2008a). Documents that where in force in 2008 and later are recorded. We have assessed the available nutrition policy documents to find policy statements that target selected nutritional risk factors and reported on availability of those. To compare our findings with other sources, global survey reports and WHO nutrition databases GINA and NOPA were assessed for the mentioning of the policy adoption state. The found documents were also assessed for the presence of nutritional goals that target NCD reduction and specifically selected risk factors.

Providing a nutrition policy framework for the CIS

Based on evidence found in agreements, literature search and assessment of existing policies we have formulated a framework with priority policy options for the CIS countries. The framework is composed of cost-effective and CIS context specific policy measures that target prioritized nutritional risk factors. Most common nutritional NCD reduction measures recommended in frameworks studied in 3.1 where considered for formulation of policy options in accordance to their relevance to the CIS context. Additional general policy options and options on multisectoral collaboration are also included in the framework, based on evidence that supports their contribution to effectiveness of nutrition policy (WHO 2012a). The framework encounters all nutritional aspects of NCD reduction and aims to guide CIS governments in the development of a national nutritional policy or a nutrition policy section within NCD or health policies.

2.4 Limitations

Our research methodology encounters several limitations. First we acknowledge that internet search on availability of policies does not encounter potentially available policies that are not (yet) published on the internet and therefore our research excludes those documents. Second, our search is preformed in English and Russian, what excludes possibly available policies in national languages of the CIS countries. Third, not all of the

chosen metabolic risk factors are fully dependant on nutrition. Genetic predisposition, cultural context and environmental conditions contribute to the prevalence of those metabolic factors as well, what could lead to overestimation of impact from selected nutrition policy measures to the overall NCDs reduction. Fourth, besides nutritional risk factors, other behavioral risk factors (tobacco use, physical inactivity and harmful use of alcohol) are also significant contributors to the premature mortality and burden from NCDs, what should be taken into account when interpreting impact of nutritional risk factors to the NCD burden. Fifth, this research has not looked into specific cultural context (religion, gender, habits, male-female ratio, education level, financial capacity) of all twelve CIS countries separately and singly took into account general regional trends. The provided framework for the CIS (chapter 3.4) should therefore be considered and adjusted in accordance to differences between this separate country specific context issues. Proper interpretation and implementation of the recommended policy measures should therefore encounter potential contribution of those issues to effectiveness of provided framework.

3. Results

The adoption of the NCD framework was initiated in 2000 (WHO 2000). Nutritional policy measures that aim to reduce mortality and burden from NCDs were integrated in global, regional and national policies since then (WHO 2014c). In 2011 the UN General Assembly agreed to develop NCD reduction policies conform outlined roadmap and in 2013 the WHA adopted a monitoring framework with time-bound voluntary targets and indicators, which encounter nutritional aspects of NCD reduction (WHO 2014d). The 2011 and 2013 agreements urged governments to set NCD plans conform outlined framework by 2015 and to start implementing those by 2016 (WHO 2014d). To facilitate timely and evidence based policy development by the CIS we have conducted a research that should provide a guideline for the development of nutrition policy documents.

In this chapter we present the results of: our search for global and regional agreements and policy recommendations for the nutrition aspects of NCD reduction (chapter 3.1); assessment of country data on risk factors and research findings from literature search on potentially effective and cost-effective measures to reduce these risk factors in the CIS (3.2); Identification of availability of nutritional policies and assessed progress made by the CIS in inclusion of all policy options that target prioritized risk factors in national health and NCD policies (3.3); and outlined framework that should guide policy formulation (3.4).

3.1 International recommendations for NCD reduction with dietary measures

There has been progress made in the development of recommended policy measures that target NCDs and diet related NCDs specifically (WHO 2000; 2014c,e). We have found that the nutritional component within the global and regional NCD reduction frameworks is included in: the Global Strategy on Diet, Physical Activity and Health (WHA57.17) (WHO 2004); the 2008-2013 global NCD action plan (WHO 2008a); the Moscow Declaration of the First Global Ministerial Conference on Healthy Lifestyles and Non-communicable Disease Control (WHA64.11) (WHO 2011b); the Political Declaration of the High-level Meeting of the UN General Assembly on the Prevention and Control of Non-communicable Diseases (United Nations General Assembly resolution 66/2) (UN 2012); the Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020 (WHA66.10) (WHO 2012a; 2013c); the Vienna Declaration on Nutrition and Non-communicable Diseases in the Context of Health 2020 (WHO 2013b); the Global Monitoring Framework for Non-communicable Diseases (decision EUR/RC62.1) (WHO 3013g); the Rome Declaration on Nutrition (ICN2

2014); and the WHO European Food and Nutrition action plan 2015-2020 (WHO 2014e).
These documents aim to provide recommendations for global, regional and national governments for policy formulations that target nutrition related NCDs. We have assessed those documents and extracted major nutritional recommendations and agreements.

3.1.1 Global recommendations

The 2004 Global Strategy on Diet, Physical Activity and Health provided initial recommendations that aim to improve the nutritional status of populations (WHO 2004). Dietary recommendations included: achievement of energy balance and healthy weight; limitation of energy intake from fats and shifts in fat consumption away from saturated fats and towards elimination of trans fat; increase in consumption of fruits, vegetables, legumes, whole grains and nuts; limitation of free sugars intake; and limitation of salt (sodium) consumption from all sources (WHO 2004). The strategy also specifies the role and obligations of stakeholders and government, and advises to define those in national policies.

The 2008-2013 Global NCD action plan was focusing on multi-sectoral collaboration and integrated policies that include strategies for reducing risk factors by encouraging healthy choices (WHO 2008a). For the promotion of a healthy diet, the plan recommended to use the 2004 strategy and additionally to support exclusive breastfeeding, promote programmes that ensure optimal feeding for all young children and introduction of measures that promote responsible marketing of foods and non-alcoholic beverages to children in order to reduce the intake of foods high in saturated fats, trans-fatty acids, free sugars, or salt (2008a). It also advised to develop a national policy and action plan for nutrition that encounters national nutrition priorities including the control of diet-related NCDs.

The 2011 Moscow Declaration of the First Global Ministerial Conference on Healthy Lifestyles and Non-communicable Disease Control (WHA64.11) emphasized once again the need for diet related policy measures for NCD reduction (WHO 2011b). The declaration urged Member States to implement cost-effective interventions (population-wide promotion, fiscal policies and policy regulations) and asked to pay particular attention to the promotion of healthy diets in line with previous recommendations. Additionally It underlined the importance of leadership and advised to act at all levels (national, sub-national and local) and across sectors by developing multi-sectoral policies to create health promoting environments that enable healthy choices.

The 2011 General Assembly outlined the elements for the Global Monitoring Framework (GMF) and the Global Action Plan for NCDs 2013-2020 (GAP) (WHO 2011a,b; UN 2012). The GAP aimed to build on what already has

been achieved by the 2008–2013 plan and provided a set of indicators to monitor trends and to assess progress (WHO 2008a, 2013a). The GAP was adopted in 2013 and offered specific policy options. The proposed nutritional policy options are intended to make progress towards GMF targets: 30% relative reduction in mean population intake of salt/sodium; halt in the rise in diabetes and obesity; and 25% relative reduction in the prevalence of raised blood pressure (WHO 2013a). As previous documents, the GAP advises to consider developing or strengthening national nutrition policies and suggested to implement indicated global strategies and recommendations. In addition the GAP advises to implement public awareness programmes on diet and reduce portion size and energy density of foods.

The 2014 ICN2 Rome Declaration on Nutrition acknowledged that nutritional aspect contributes to high socio-economic burden and urged to recognize that environmental changes have an impact on dietary patterns, leading to the increase in NCDs through increased consumption of unhealthy foods (ICN2 2014). The ICN2 advised that nutrition policies should promote a life-course approach and empower consumers through the provision of evidence-based information and education regarding consumption of food products. The framework for action (FFA) that was outlined by ICN2, states nutrition actions that aim to reach no further increase in childhood overweight and to achieve diet related GAP targets. The FFA NCD actions support the global recommendations for healthy nutrition (promotion of exclusive and continued breastfeeding, limitation of marketing for children, fruit and vegetables of 500 g per day; intake of saturated fat <10% of total energy intake; intake of trans fatty acids is kept to < 2% of total fat intake; intake of free sugars < 10% of total energy intake or, preferably < 5%; intake of salt < 5 g per day.) and outline several mechanisms to improve nutrition. The main course is to strengthen policy strategies conform GAP.

3.1.2 Regional recommendations

Health 2020 is a WHO regional health policy framework that was adopted by all CIS countries in 2012 (WHO 2013e). Reducing NCD is one of the priority areas of the framework. In the context of Health 2020 the CIS governments committed to the Vienna declaration on nutrition and NCD in 2013, which aimed to facilitate actions to prevent overweight and obesity by investing in diet related NCD prevention and encouragement of healthy eating (WHO 2013b). The declaration urged governments to develop nutritional action plans that include economical interventions to address inequalities in affordability and availability of healthy foods, implement educational interventions and create healthy environments. The key priority areas are identified as reduction of excessive intake of energy, saturated fats and trans fats, free sugars and salt, as well as increase in consumption of vegetables and fruit. This should be reached by implementing interventions aimed at reduction of food marketing pressure of unhealthy foods,

promoting breastfeeding and healthy nutrition choices, reformulation of product nutritive value, use of labeling and nutrient profiling tools and engagement in intersectoral collaboration.

The European Food and Nutrition action plan 2015-2020 resulted from the vision of Health 2020 framework and focused on food and nutrition as the leading factor for addressing NCD in the region. Similar to global recommendations and FFA, the plan aims to create healthy nutrition environments, promote an healthy diet throughout life-course and strengthening governance and surveillance (WHO 2014e). The plan specifies that healthy nutritional environments can be reached by adopting regulating measures for marketing, considering economic tools like subsidies and taxes for the promotion of product nutritive value reformulation, use of consumer friendly labeling on the packages and engagement of collaboration to facilitate healthier food choices in public settings. Promotion of health through life-course should be addressed through investment in nutrition at the earliest stage (pregnancy, breastfeeding, complementary feeding), improvement of food and health literacy, encouragement of use of social media to promote healthy diet, and by accounting special needs of vulnerable groups. Promotion of healthy diet should also be facilitated by ensuring that care facilities are committed to execute health promotion and disease prevention counseling interventions, provision of universal health coverage for preventable and treatable diet-related problems, and establishment of nutritional intervention in public settings. Surveillance should be strengthened through extensions of monitoring systems, establishment of nutrition and anthropometric surveillance, ensuring proper use of data in policy making and evaluation of interventions to determine their effectiveness in various settings. Finally the plan advised to strengthen governance through the establishment of intersectional alliances and collaborations at different administrative levels and across departments and by supporting multistakeholder actions to decrease conflicts of interests.

3.2 Effective measures

The assessment of regional statistical data delivered representation of impact of several dietary and metabolic risk factors for NCDs in the CIS. Primary and secondary data sources were used to find relevant figures from all twelve countries. Literature research provided prediction of dynamics in risk factors for the CIS and prioritized policy interventions, based on developments in other countries and indicated cost- effective practices that could be implemented in low- and middle- income country and/or CIS context. Systematic and peer reviews, meta-analysis and other scientific study publications were assessed in medical and nutritional journals, and scientific database PubMed. Medical educational literature (books) provided additional information about metabolic risk factors influenced by nutrition. This chapter presents findings from this assessment and shows evidence for selection of prioritized policy interventions.

3.2.1 Risk factors

Nutritional risk factors (inadequate child nutrition, excessive energy intake, diets rich in salt, fat and calories, and low in fruit and vegetables) could lead to metabolic changes like raised blood pressure (hypertension) and raised blood lipids (hypercholesterolemia), overweight and obesity, and play therefore a major role in preventing NCD development and premature mortality (Bouman ln and Bernards JA 2002; Bowman et al. 2004; De Volgi R et. al. 2014; Heine et al. 2004; Kleiman S et. a., 2012; Lim et al. 2012; Lobstein T 2014; Rolfes et al. 2006; WHO 2008d; 2011d). Table 3 shows that this metabolic risk factors are highly prevalent in the CIS (WHO 2008b; 2010a; 2013f; 2014a).

Table 3 Prevalence of raised cholesterol, hypertension, overweight and obesity (in %) across CIS countries

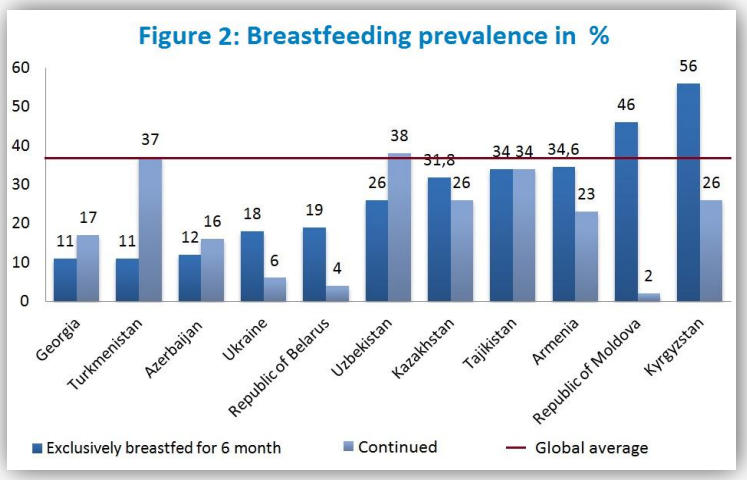
	Raised cholesterol	Hypertension	Overweight	Obesity
Armenia	40.8	41.9	55,5	24.0
Azerbaijan	34.8	31.9	56.1	23.8
Republic of Belarus	51.1	41.8	57.4	24.3
Georgia	37.1	42.7	54.1	22.1
Kazakhstan	45.7	35.0	55.6	23.7
Kyrgyzstan	30.1	32.7	43.8	15,5
Republic of Moldova	36.5	40.4	50.0	21.1
Russian Federation	50.6	37.8	59.8	26.5
Tajikistan	24.0	30.9	30.9	8.6
Turkmenistan	35.1	31.0	41.5	13.2
Ukraine	44.4	45.1	53.5	21.3
Uzbekistan	26.8	24.7	44.2	15.1

Fast rise in availability of unhealthy food commodities that is seen as contributors to nutritional risk factors is recorded in low and middle income countries, as well as changes in structure of diet due to economic grow, westernization of nutrition patterns and urbanization (Coca Cola 2012; ISO

2012; Nebraska A. et. al., 2010; Popkin BM., 1998; WHO 2014d). This could predict similar trends in the CIS and indicate need for surveillance on metabolic and nutritional risk factors (Beaglehole R et. al. 2011). Evidence in chapter 2.1 already provided justification for that phenomenon and identified its contribution to NCD epidemic (Cecchini M. et. al. 2010; Hawkes 2006; Lieberman, 2003; Monteiro CA 2011; Moodie R et. al. 2013; Stuckler D 2012; WHO 2002a; 2010c;). Nutritional risk factors; high intake of fat, sugar and salt, low intake of fruits and vegetables, marketing pressure and inappropriate breastfeeding are further supported with evidence from the assessed literature. Their impact in the CIS is determined based on statistical evidence found. Effective policy measures are recorded.

Infant and young child feeding

Increasing the duration of breastfeeding has many health benefits including preventive effects on overweight and obesity (Harder et. al., 2005). Evidence shows that maximal health gain can be achieved by breastfeeding exclusively at least for six month and preferably longer (2 years) with addition of complementary feeding (Kramer M. S., and Kakuma R. 2002; WHO 2002b). Data from global health observatory and DevInfo data catalogues, that was recorded based on national surveys, shows that between 2006 and 2012 less than 46% of infants where exclusively breastfed, except for Kyrgyzstan where the figure is higher (figure 2). The databases estimate global average of exclusive breastfeeding on 37% and that indicates significantly lower coverage in the most CIS, except for Moldova and Kyrgyzstan. Extremely low figures are recorded in Azerbaijan, Belarus, Georgia, Turkmenistan, Ukraine and Uzbekistan, where prevalence was 10% lower than the global average. Prevalence of continued breastfeeding (longer that 6 months) was even lower, with highest in Uzbekistan (38%). Remarkable is the fact that Azerbaijan, Georgia, Turkmenistan and Uzbekistan report higher rates for continued breast feeding comparative to exclusive breastfeeding. That could suggest that breastfeeding rates in the first six month are actually higher, but the practice account complementary feeding and therefore is not recorded as percentage of exclusive breastfeeding. No data for Russian Federation was found in the databases, therefore additional search in national databases and global reports was conducted, which also delivered no evidence-based results. Some sources (web publications based on interviews with Russian health professionals) report that estimated breastfeeding prevalence in the first six months was about 40% in 2014 in



the Russian Federation, however exclusive breastfeeding is estimated much lower. No additional data was found on continued breastfeeding prevalence.
Policy measures that are globally recommended for promotion of breastfeeding include implementation of separate policies for infant and young child nutrition and inclusion of health education practices that inform about benefits of breastfeeding, restrictions for marketing of breast milk substitutes, creation of suitable environments (in public and work places) and surveillance to monitor progress.

Overweight and marketing pressure

Beyond the increased risk of becoming an overweight adult, overweight children are often diagnosed with at least one additional risk factor for NCDs, such as elevated blood pressure or raised blood cholesterol (International Food Policy Research Institute 2014; WHO 2006a; 2014c,e). Global reports show that childhood overweight prevalence (% of overweight children under 5 years of age) in 2005 was 9% in Moldova and 10% in Belarus (International Food Policy Research Institute 2014;). No data was found for under 5 overweight prevalence in other CIS countries or neighboring Eastern European countries (Bulgaria, Czech Republic, Latvia, Lithuania, Poland, Slovakia, Romania) (International Food Policy Research Institute 2014;). The search in secondary sources, that attempted to find figures from other CIS countries and/or more recent prevalence numbers, delivered no results as well. To see what the trends in youth overweight are in the region, we looked at adolescents overweight prevalence for the children of 11 years of age. We see that in Armenia 26% of boys and 17% of girls are overweight, in Russia this figure is 32 and 18 percent and in Ukraine 22 and 12 percent (WHO 2013f). No data is available for other CIS countries for children at that age (WHO 2013f). Based on global trends in childhood and adolescents overweight, we could suggest that the prevalence in the CIS correlates with global increasing dynamics, specifically taking into account that low and middle income countries are vulnerable for unhealthy dietary pattern changes at this moment (Currie C et. al. 2012; International Food Policy Research Institute 2014; WHO 2013f).
Multiple research shows that marketing of foods have strong effect of dietary pattern of children and their risk on overweight, obesity and NCDs (WHO 2013h). Media marketing of foods high in fat, salt and sugar is strongly discouraged. Recommendations advice to manage food taxes and subsidies, to promote healthy diet and availability of healthy food in all public institutions, and to conduct public campaigns and social marketing initiatives to inform and encourage consumers about healthy diet (WHO 2013a,h).

Salt

A meta analysis of 36 studies and additional studies show that elevated sodium intake has been associated with a number of NCDs and decreasing sodium intake is highly effective in reducing blood pressure and the risk of associated NCDs (Beaglehole R et. al. 2011; Bibbins-Domingo K et al. 2010;

He FJ et al. 2013; WHO 2003b; WHO 2012c; WHO2014d). In 2010 four of five death from cardiovascular diseases in low and middle income countries could be attributed to increased sodium intake (Mozaffarian, D. et al. 2014). The recommendations are to reduce sodium intake to <2 g/day sodium (5 g/day salt) in adults in order to reduces blood pressure (WHO 2012b; 2014d). We have found that all CIS countries exceed the recommendation with mean populations sodium intake in Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan of over 4,25 g sodium per day and in Moldova, Russian federation and Ukraine 3,5-4,24 g sodium per day (WHO 2014d). Most people exceed the recommended consumption amount, mainly due to high consumption of possessed foods and ready-made meals, that are rich in salt (WHO 2014d). Global recommendation are focused on creation of intersectoral and multidisciplinary policies that promote environments that enable populations to consume adequate quantities of salt (WHO 2007b; 2014d). This recommendations include industry regulations (fiscal and labeling) that target reduction of salt content in food products and enable consumer education to reach long term health benefits and reduce treatment costs (WHO 2014d).

Fats

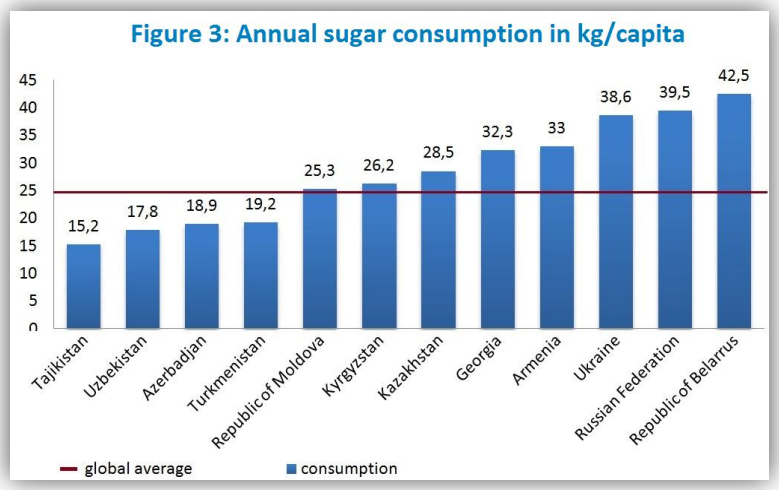
Saturated fats can mainly be found in dairy products, red meat, biscuits, savory snacks and processed foods. Trans fats are mainly found in junk foods including cakes, pastries, crisps and take-away foods. Both sorts of fat have negative impact on serum cholesterol levels, which is associated with increased risk in cardiovascular diseases (Clarke et. al. 1997; FSA 2007). The recommendation for adults is to limit total fat intake to 30 energy percent (E%) from total dietary energy intake, saturated fat intake to 10E% and trans fat intake to 1E%, in order to reduce risk on developing NCDs (Hooper L et. al. 2012; WHO 2003d). No data has been found that reports fat consumption rates in the CIS in the past 5 years from primary sources (governmental sites, statistical databases, sectoral reports). Database Chartsbin.com (public contribution database) reports that total fat consumption in 2005-2007 in Azerbaijan was 16 E%, in Georgia, Moldova, Kyrgyzstan and Turkmenistan 20-24 E%, in Armenia, Kazakhstan, Russian Federation, Tajikistan, Ukraine and Uzbekistan was between 24-28 E% in Belarus 32 E% (ChartsBin 2011). This secondary data indicates that only Belarus should take measures to reduce the fat intake. However, considering changes in nutritional patters of the CIS since that period, this data suggests that evidence-based research on current fat consumption (total, saturated and trans fats) is needed to state actual fat intake in the CIS and to identify the urge of taking measures. Research on lower and middle income countries shows that CIS could be vulnerable for increase in fat intake due increase in consumption of unhealthy and processed foods (Popkin BM., 1998). One regional research suggests that in 2009 contents of trans fatty acids in popular foods is still high in Eastern European EU countries (Stenders 2012). The 2009 food consumption survey reported that total

dietary intake of fats in Central and Easter European countries (Austria, Czech Republic, Denmark, Hungary, Germany, Poland, Romania and Slovenia) in children (4-14 years) is 30-35E% and in adults (19-64 years) 31-40 E% (EC 2009). Among older adults (older than 64 years) the figure was even higher 34-41E% (EC 2009). This data could suggest that the E% intake of total fat and trans fats in foods could be similar in the neighboring CIS countries.

Actions by the food industry are effective in reducing total fats and trans fats. Trans fat labeling, limitations for producers in fat content and promotion of appropriate choices to consumers seem to be effective in lowering populations fat intake (FSA 2007). Changing fatty acid composition of cooking oil, pricing strategies are sustainable and cost effective way to reduce saturated fat intake (WHO 2009). Additionally monitoring fat intake could improve surveillance.

Sugar

High consumption of free sugars from food and drinks is linked with overweight, obesity and related NCDs (Basu S., et al. 2012; Morenga LT 2013). Current WHO recommendation is to limit free sugar intake to maximum of 10E%, and preferably 5E%. There is no data available on consumption of free sugar in energy percentage, however we have fond annual per capita sugar consumption in kilograms (from beet and cane sugars) in the CIS. Figure 3 data shows that consumption varies significant between the CIS countries in 2012 (ISO 2013). The global average consumption for 2011 was estimated at 24.2 kg (ISO 2012). This indicates that Armenia, Belarus, Georgia, Republic of Moldova, Russian Federation, Kazakhstan, Kyrgyzstan and Ukraine exceed the average (ISO 2013). There is also evidence that consumption has been growing in the recent years in Belarus and Russian Federation, and that the regional consumption could increase further due to increase in consumption of processed foods (ISO 2012). Increase is already been recorded for consumption of sugar-sweetened beverages, particularly in low- and middle-income countries as a result of heavy marketing (Coca Cola 2012; Nebraska A. et. al., 2010; Kleiman S et. a., 2012; Lobstein T., 2014).



Research shows lack of evidence for concrete recommendations and measures for limiting the free sugars intake (Rennie K and Livingstone M., 2007). Also WHO 2014 draft sugar guideline underlines limitation of data on this topic and provided this document for public consultation. Based on other potentially harming ingredients, like salt and fat, we can state that policy

measures should include recommendations for industry to limit addition of sugar in products and marketing of products rich in those. However more evidence is needed to formulate specific policy measures.

Fruits and vegetables

Fruits and vegetables are important components of healthy diets and help to prevent NCDs, such as hypertension, overweight, obesity and hypercholesterolemia (Boeing et. Al. 2012; Djoussé et. al. 2004; WHO 2003c). Recommendations for minimum intake of fruits and vegetables are 500g per day (ICN2 2014). According to the WHO country profiles, mean population fruit and vegetable intake in Armenia, Azerbaijan, Belarus, Kazakhstan and Uzbekistan equals or exceed 600g per day. Kyrgyzstan, Turkmenistan, Russian Federation and Ukraine consume between 500-600g, Moldova and Tajikistan, consume between 400-500g and Georgia has consumption of under 300g (WHO 2013f). Since price is often reported as a barrier for consumption of fruit and vegetables, evidence suggests that agricultural subsidies that encourage fruit and vegetable production could increase consumption of fruits and vegetables, improve dietary patterns and strongly facilitate sustained production and marketing of healthier foods (CDC 2011; Wallinga D. 2010). Regulating pricing strategies could therefore positively influence the consumption in all countries, but are of significant importance for Georgia, Moldova and Tajikistan, where intake does not meet recommendations. Evidence shows effectiveness of mass media promotion campaigns on fruits and vegetables, however the campaign needs to be continued for several years to reach sustainable results, what requires financial security (WHO 2009).

3.2.2 Costs and effects of policy measures

Dietary risk factors significantly contribute to disability and financial burden from NCDs and policies that promote consumption of foods low in salt, sugar, saturated and trans fats, and high in fruits and vegetables, contribute to significant burden release (Beaglehole R et. al. 2011; Bloom DE., et. al. 2011; ICN2 2014; Lock K et al. 2005; Wolf and Colditz 1998). According to the recommendation for policy formulations, decrees in salt intake, replacement of trans fats with polyunsaturated fats, implementation of public awareness programmes and promotion of breastfeeding are very cost-effective interventions with high-impact and feasible implementation (WHO 2014d). These policies are cost-effective through reduction of health-care costs in the future, especially in low-income and middle-income countries (Cecchini M. et. al. 2010).

Nutritional education and policy measures that target nutritional risk factors are effective in preventing excessive body weight, hypertension and hypercholesterolemia and herewith contribute to total NCD reduction (Heine et al. 2004; Bowman et al. 2004; Lim et al. 2012; Rolfes et al. 2006; WHO

2003a; 2007a). Measures like labeling to educate about specific foods, economic tools (food taxes, subsidies), fiscal market regulations (portion size, food composition) for fast-food distribution, limitations on marketing of unhealthy food for children and mass-media campaigns to promote health, seem to have effect when it comes to reduction of several NCDs and have a favorable cost-effectiveness profile (Beaglehole R et. al. 2011; Briggs AD et. Al. 2013; Cecchini M. et. al. 2010; De Vogli R et. al. 2014; EC 2012; Gaziano T et.al. 2007; Murray C et. al. 2003; Rolls BJ., et. al. 2002; WHO 2009; 2011e; 2013h). Price regulations seem to provide the largest health gains in short term and interventions targeting children are most effective in the long term (Cecchini M. et. al. 2010). Introduction of labeling that mark foods as healthy, facilitate right food choices by educating about specific products are seen as cost-effective (WHO 2009). Those interventions are indicated to be suitable for health information, consumer awareness, empowerment and education.

In a package those measures deliver substantial health gains and compared with the alternative strategy of treating NCDs, population-based prevention policies can generate more health gains and are more cost-effective through reduction of future healthcare costs (Cecchini M. et. al. 2010). According to Cecchini et. al. regulation of advertising to children also seem to be even more effective and efficient than school-based health promotion (2010). What distinguishes these interventions from targeted strategies (school-based or work-based interventions, and counseling in primary care) is their greater coverage, due to larger exposure and the fairly low cost of implementation. However, in countries with less capacity constraints (Tajikistan), interventions in primary care can be very effective as well (Cecchini M. et. al. 2010). School based education interventions could be effective in reaching sustainable health gains if supported by complementary community-wide strategies and by involving parents (WHO 2009). To increase effectiveness of this measures there is need to take cultural and economic needs of vulnerable groups (low income) into account (WHO 2009). Award scheme practices for public places (workplaces, educational establishments) seem to be effective in increasing consumption of healthy foods, but are costly and therefore considered less appropriate for the most CIS. Establishing intersectoral collaboration and targeted surveillance of implementation could facilitate those schemes and possibly make them more suitable for CIS. Interventions that require computer use for health education seem to be effective but could be less appropriate for low- and lower-middle income setting. Data on availability of computers per household in countries with limited financial capacity (Armenia, Georgia, Kyrgyzstan, Moldova, Ukraine, Uzbekistan) is needed to state whether this practice is efficient.

3.3 Availability of nutrition policy measures in the CIS

As chapter 3.1 outlined, all twelve CIS countries have committed to NCD reduction plans that include nutritional recommendations. To see what actions already has been taken we have searched for national policy documents relevant to nutrition and NCDs.

In sum 51 governmental websites where studied. 12 national governmental websites, 12 ministry of health websites and 12 ministry of agriculture websites were systematically assessed for presence of policy documents or mentioning's of those to be in force. Policy search on 7 websites of national nutrition and agricultural institutions and academies where preformed for Belarus, Moldova, Russian Federation (2 websites), Kazakhstan (2 websites) and Ukraine.
Armenia, Azerbaijan, Georgia, Kyrgyzstan, Turkmenistan, Tajikistan and Uzbekistan had no websites for nutritional institutions available, therefore additional search on 7 sanitary and hygiene institutions websites was performed. For Turkmenistan website of health information center was also assessed. Additional search on GINA was preformed to identify availability of policy measures and on general search on Google and Yandex was performed for all countries to indicates mentioning of nutrition policy documents on other official (governmental or institutional) websites.
The search identified a total of 27 (23 available for public assessment) adopted policies and several additional mentioning's of policy existence. Specifically, 8 national policies that state nutritional NCD reduction targets, however only 4 of those are available for public assessment, 11 breastfeeding policies, 3 policies on reduction of marketing to children 1 school nutrition policy, and 4 other relevant policies. For countries where no policy or official mentioning's of adaptation were found, search on secondary sources (non-governmental or public) delivered us mentioning's of existing policy documents. The available policies were assessed for presence of policy options that target metabolic and nutritional risk factor for NCD reduction.

3.3.1 Policy assessment

Azerbaijan and Belarus have several mentioning's of plans for development of nutrition related health and NCD policy documents in the period between 2008 and 2014, however no indication was found that those policies are developed in English or Russian or are in force on the date of the search. Specifically Azerbaijan has mentioning's for development of NCD reduction policies 2013-2020 with specification of nutritional goals and Belarus has mentioning of plans to develop nutritional policies since 2008. Georgia and Ukraine have no mentioning of existence of such policy documents in English or Russian. Armenia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan have policy or supporting documents that evidences that nutritional policy measures are in force.

Armenia mentions available NCD policy document with nutritional goals and shares the document publicly, however this document is only available in Armenian and therefore could not be assessed. Kazakhstan has a national health policy 2011-2015 with nutritional section, including measures to reduce fat, sugar and salt intake, promote breastfeeding and labeling, implement appropriate school nutrition programmes, obesity reduction goals, and plans for development of separate nutritional policy document. Kyrgyzstan has NCD policy 2013-2020 available with nutrition section that encounters only goals for obesity reduction and nutrition education. Republic of Moldova has a national health policy with nutritional section that include statements on fat reduction through health promotion, school based programmes, fruit and vegetable consumption promotion and obesity reduction, as well as surveillance legislation on health available. Russian Federation has available nutritional policy in force till 2020 that states intentions to take measures in fat reduction, labeling, breastfeeding, child nutrition and obesity. Tajikistan has National Health Sector Strategy 2010-2020 with nutrition section, Turkmenistan has adopted national NCD reduction strategy 2011-2015 with nutrition component and NCD strategy for 2014-2020 and mentions of adoption of nutritional program 2013-2017, and Uzbekistan has indication for adoption of NCD 2011-2015 action plan with nutrition section, however none of this documents are available for public assessment.

Other policies relevant to the NCD reduction

Enforced policy documents that target promotion of proper infant and young child feeding were found for all CIS countries, except for Moldova, Belarus and Ukraine. The policies state a recommendation for exclusive and continued breastfeeding conform recommendations. GINA reports that all off the CIS countries have adopted policy options for promotion of breastfeeding in 2012, except for Ukraine. Armenia has documents in public access concerning school nutrition. Kyrgyzstan has mentioning's of school nutrition policies and Kazakhstan mentions realization of school nutrition programs. Some Ukrainian secondary sources mention availability of programs directed towards improvement of child nutrition. Azerbaijan has a policy on marketing of unhealthy foods to children in development and Moldova, Tajikistan and Uzbekistan have enforced regulations on this issue. Tajikistan has also document available on improvement of health information, a decree on creating environments for healthy nutrition and a decree to conduct research on NCD risk factors.

Additional policy documents

Additionally we found that Azerbaijan has mentioning's of nutrition safety programme 2008-2015, Georgia has document available on food safety and mentioning on plans to develop other nutrition related documents. Kyrgyzstan has mentioning's of food safety policies and agricultural legislation with normative for nutrient values.

3.3.2 Data comparison

We have searched for global reports that indicate the country status in regard to presence of NCD policies and nutritional policies that address healthy diet, overweight and obesity, to compare to our results. Additional to the global reports, we have found that a Country Capacity Survey on progress in development of NCD reduction policies has been assessed in 2010 and 2013 (WHO 2014c). Table 4 shows that in 2010 only some countries reported to have integrated national policy and operational action plan available (+) or in development (in dev.), while in 2013, most of the countries had such documents available, except for Georgia and Kazakhstan where no such action occurred (-) and Belarus where no data was found. Concerning the availability of operational policies specifically addressing the unhealthy diet and/or obesity/ overweight specifically, we have found that the global survey was assessed in 2010 and only several countries had such policies in place (WHO 2010d). The WHO 2014 country profiles show that in 2014 even les countries had available operational policy, strategy or action plan to reduce unhealthy diet and/or promote healthy diets (WHO 2014a).

Table 4 Status on presence of operational policies or action plans

	NCDs		unhealthy diet/obesity/ overweight		Nutrition action
	2010	2013	2010	2014	2015
Armenia	+	+	+	+	+
Azerbaijan	-	In dev.	-	-	No data
Republic of Belarus	+	No data	+	-	No data
Georgia	-	-	-	-	-
Kazakhstan	+	-	+	-	+
Kyrgyzstan	No data	+	-	+	+
Republic of Moldova	In dev.	In dev.	-	-	+
Russian Federation	+	+	+	+	+
Tajikistan	+	+	+	+	+
Turkmenistan	-	+	-	+	+
Ukraine	-	In dev.	-	-	-
Uzbekistan	-	In dev.	-	-	+
Available (+)		*Not available (-)*		*in development (In dev.)*	

Global and regional recommendations shows that integrated and multisectoral policies seem to be the most effective in reducing diet related NCDs. Therefore in scope of this research we assume that if countries have integrated health and/or NCD policies with specified nutrition section that contains at least some key elements of healthy diet, it could be recorded as present *nutrition action*. Nutrition action 2015 in table 4, last column is therefore defined as present if a county has health or NCD policy that specifically states NCD related nutritional goals or has a separate nutrition policy. However we do recognize that full nutrition policy is not equal to nutrition section and the need for specialized nutrition policies is still urgent. Also we recognize that stating nutrition action as present in that context does not indicate presence of all recommended options that target all NCD related nutritional risk factors. Found separate breastfeeding, child nutrition and additional policies that do not specifically state NCD reduction goals are not encountered as *nutrition action* in table 4.

3.4 Providing a nutrition policy framework for the CIS

In previous chapters we have observed international recommendations for NCD prevention with nutrition policy actions, indicated metabolic and nutritional risk factors and their contribution in the CIS and found effective and cost effective practices. Assessment of found policy documents shows that progress was made in development of NCD polices, however there is limited evidence to state that nutrition section within those policies encounter all relevant risk factors. Also no separate nutrition policies could be found for assessment. Based on our findings we suggest in this chapter a framework with policy formulations that could be used by the CIS governments in design and assessment of nutritional section of national health and/or NCD policies or a separate nutrition policy to improve NCD reduction strategies. As financially and ethical appropriate to the country context additional measures, not stated in this framework, but shown to be effective in decreasing metabolic risk and nutritional risk factors are highly encouraged for inclusion as well.

General policy objectives

- Acknowledge contribution of dietary factors to development and progression of several NCDs in the country;
- set measurable monitoring indicators for metabolic risk factors that are preventable with dietary measures (overweight, obesity (child and adult), hypertension, hypercholesterolemia), to assess country dynamics;
- set measurable monitoring indicators to assess progress in nutritional risk factors (fat, salt, sugar and fruit and vegetable consumption, and breastfeeding rates) and assess progress;
- research composition of populations dietary intake (total energy intake; most consumed food products) to anticipate with measures;
- commit to evidence based and cost-effective policy practices that target nutritional risk factors (high salt, fat and sugar consumption, low fruits and vegetable consumptions and low breastfeeding rates) to improve surveillance and reduce potential financial burden;
- commit to evidence-based health promotion and marketing reduction strategies and enable healthy environments;
- prioritize use of population based interventions with specific encountering of low income groups;
- use a life course approach starting with proper infant feeding and continuing with proper child nutrition, adult health promotion and support of healthy choices for elderly population;
- outline specified time-frame to measuring results;
- specify stakeholders and their role in the execution of the policy, assign responsible parties;
- promote multi-sectoral collaborations to reach sustainability, by integrating nutrition policy measures into policies of relevant sectors;

- establish international agreements for trade regulations (packaging and product composition standards, strategies to encourage trade in healthy products).
- Offer variety of healthy food choices and limit promotion of unhealthy public food occasions true subsidies, taxes and marketing regulations (restaurants, canteens, caterings etc.)

Infant and young child nutrition

- Continually evaluate existing separate policies on infant and young child feeding and measure monitoring indicators to assess development;
- monitor implementation of existing policies;
- promote appropriate breastfeeding (exclusive and continued) through health education about NCD reduction in health centers and the community;
- reduce inappropriate marketing for infant feeding by implementing International Code of Marketing of Breast-milk Substitutes;
- establish facilities to support breastfeeding in public and work places.

Salt reduction

- Set targets to measure sodium intake;
- develop national dietary guideline on salt, including product category specific targets and prioritizing products (possessed foods and fast foods);
- develop and implement consumer-friendly salt labeling regulations that highlight salt content in foods (including symbols for low sat products);
- develop and implement consumer education and marketing campaigns that inform about the impact of excessive salt consumption on health;
- set legal and economic regulations to food industries to lower the salt content of products;
- encourage production of products low in salt content through subsidies;
- monitor salt content of food and promote product reformulation;
- set agreements with the catering industry, restaurants and public facilities to reduce addition of salt to meals;
- encourage promotion of healthy food and nutritional education in schools, workspaces and public institutions.

Fat reduction

- Establish surveillance system to monitor fat intake (total fat, saturated and trans fats) in energy percent;
- introduce enforced nutrient profiling by food industry for fat content in dairy products, red meat, snacks and processed foods;
- support evidence-based interventions (e.g. changing fatty acid composition of cooking oil) with subsidies;
- introduce pricing regulations (taxes) for foods high in fat;
- introduce enforced and appropriate labeling of foods by producers to educate and enable healthy choices.

- set agreements with catering industries, restaurants, work and public places to reduce fat content in meals and promote healthy choices;
- establish agreements with food stores and institutions to promote healthy diets;
- establish agreements with educational institutions to limit distribution of foods high in fat and to educate about health consequences of high fat intake and sorts of fats.

Sugar reduction

- Set targets to measure sugar intake;
- set agreements with food industry to reduce content of sugar in foods and drinks through mandatory reformulations;
- enforce taxes for sugar-sweetened beverages;
- set agreements with schools, work and public places to restrict sale of soft drinks and candy bars, limit unhealthy content of vending machines and promote consumption of water and healthy foods;
- conduct public health education through social marketing campaigns in public places, enforcement of school education about sugar and introduction of workplace interventions;
- restrict promotion and advertising of sugar-sweetened beverages on television and other media (legal measures, regulations).

Increasing fruit and vegetable intake

- continually monitor populations fruit and vegetable intake;
- implement economical tools (subsides) in collaboration with agricultural sector to ensure affordability of fruit and vegetables in low income group;
- ensure availability of fruit and vegetables in schools, public an work places;
- set agreements with mass media to promote fruit and vegetable consumption through campaigns;
- set agreements with retailers to support provision of less costly (seasonal) fruit and vegetable options to promote healthy environments;
- expand farmers markets in all settings;
- support and promote community and home gardening;
- ensure surveillance and monitoring of fruit and vegetable programmes;
- establish partnerships to ensure fruit and vegetable provision, through multisectoral collaboration across the continuum of production, distribution, storage, marketing and consumption.

Marketing pressure reduction

- Discourage marketing messages about foods rich in fat, salt and sugar through mass media (TV, radio, internet, films, games, videos) with economical and legislative tools;
- conduct public campaigns and social marketing initiatives to inform about healthy choices and encourage healthy food consumption in public places;

- promote self regulation by encouraging the industry to agree on sectoral commitment;
- set multilateral agreements for import of packaging, and mass media promotion of unhealthy foods;
- Implement Code on marketing food and non-alcoholic beverages to children (European Network on reducing marketing pressure on children 2009; WHO 2013h);
- Encourage provision of healthy foods at schools, work and public setting and limit marketing of unhealthy foods

Multi-sectoral collaboration

- Establish legislative regulations and voluntary agreements for mass media industry to reduce marketing of unhealthy foods and increase promotion of healthy lifestyle and nutritional choices.
- establish agreements for food industry and agricultural sector for nutrient profiling of products;
- develop regulations for industries for appropriate packaging and labeling of food products;
- collaborate with educational institutions and health professionals to implement nutrition education that enabled informed choices and provide subsidies for provision of healthy choices;
- support research on improvement of populations nutritional status and health;
- encourage international food services and catering outlets to improve the nutritional quality of their food, review portion size and price.

4. Discussion and Conclusions

There is recognition of presently high and further increasing burden of premature mortality and disability from NCDs and great a contribution of nutritional aspect to that burden. In order to reduce socio-economic consequences, implementation of national nutrition policies that effectively target risk factors should be developed. We aimed to formulate a nutrition policy framework that should guide CIS governments in development of such nutrition policies. To do that we have first searched for global and regional recommendations that address dietary risk factors in documented agreements, reports and frameworks; second, assessed databases to indicate the impact of those risk factors in the CIS and studied literature to find most effective and cost-effective policy interventions to target selected risk factors; third indicated and assessed national policies of the CIS countries that target nutrition actions; and fourth provided a framework with prioritized nutrition policy measures, that should facilitate nutrition policy formulation for the CIS.

To organize priority of our evidence we have divided found data into primary and secondary source data. For chapter 3.1, international recommendations, only primary data was collected from global and regional governmental agreements, action plans, frameworks and reports. With regard to chapter 3.2, effective measures, primary data was obtained from the global statistical reports and databases, national statistical databases, medical study books and scientific literature. For several indicators in chapter 3.2 no data was found in primary sources, then a search on secondary sources (public contribution web-pages and nongovernmental databases) was performed. With regard to chapter 3.3, availability of nutrition policy measures in the CIS, our methods assumed that policy identification search from primary sources (national governmental and institutional websites and global databases) would provide more available policy documents for public assessment, however only limited results were found. That could be partially explained by the limitations of our search (internet and language). However, this resulted in limited progress assessment and introduction of the term 'policy action'. The term policy action defined by us therefore does not reflect on completeness of the policies or actual progress made in development of appropriate policy options that encounter all relevant risk factors, but singly indicates that there are mentioning's of exciting nutrition policy measures in primary sources. Secondary data (mentioning's of policy existence on nongovernmental web pages) was collected through application of general search on the search engines Google and Yandex. However it did not deliver significant contribution to our results. Chapter 3.4, providing a nutrition policy framework, was based on the results found in the previous chapters from primary and secondary data. Enough evidence was found to suggest a framework in line with recommendation found in 3.1 and data found in 3.2 and 3.3.

Search for international recommendations and assessment of global and regional policy documents, agreements and frameworks for diet related NCD reduction (3.1) has indicated that progress has been made in global, regional and national recognition of nutrition as a major NCD risk factor and development of general recommendations for nutrition policy formulations. Global and regional agreements adopted by the CIS urge national governments to develop separate multisectoral nutrition policies and to integrate nutritional recommendations into national health policies, NCD reduction policies and policies of other sectors that influence production, distribution and consumption of food and beverages. The main recommendations from global and regional frameworks include economic and educational interventions and regulation that facilitate healthy environments, promotion of healthy diet through life-course and strengthening of governance and surveillance. Specific attention should be paid to nutritional interventions that target risk factors: breastfeeding, intake of salt, sugar and fat, fruit and vegetable consumption and reduction of marketing pressure.

We have observed high prevalence of metabolic risk factors that are majorly influenced by the nutrition pattern (hypertension, hypercholesterolemia, overweight and obesity) in the CIS. The impact of selected nutritional factors (breastfeeding, marketing pressure in regard to child obesity, salt, sugar, fruit and vegetable consumption) was determined by consumption rate and coverage. This figures showed differences between the CIS countries. In regard to reducing marketing pressure prevalence of childhood obesity was assessed. Summarizing the results of 3.2, we can conclude that exclusive breastfeeding prevalence is relatively low in the CIS region, and continued breastfeeding rates are even lower; childhood obesity figures are not available for the CIS and this indicates the need for taking monitoring actions; salt and sugar intake are very high In the most CIS; the search on fat intake resulted only in secondary data, what indicates the need for fat consumption surveillance in the region. Available data on fat suggests that CIS could benefit from applying fat reduction policy measures. Fruit consumption seems to be satisfactory in all countries, except for Georgia.

Literature study on effective and cost-effective measures showed that reduction of nutritional risk factors could be reached by implementation of evidence-based and cost-effective policy options like: legal interventions aimed at reduction of food marketing pressure, labeling and nutrient profiling, fiscal and economic market interventions for the food industry and agricultural sector, subsidies and regulations for promotion of healthy environment in public places (schools, work, hospital etc.) and agreements with (mass) media for promotion of healthy foods. Establishment of multisectoral collaborations and international trade agreements could potentially increase effectiveness and cost-effectiveness of facilitated practices. Surveillance system through settlement of time-bound targets should ensure proper monitoring of developments.

National policy search (3.3) resulted in total identification of 27 adopted policy documents and several mentioning's of available policies from primary sources. 23 of those policies were available for public assessment, among which, NCD and health policies and topic specific policies. Assessment of availability of nutritional section in health and NCD policies and separate national policies showed that the most CIS countries already established health and NCD reduction policies that encounter nutritional section. However majority of the countries have no separate nutritional policy or action plan mentioned and only Russian Federation has it available for public assessment. Eight national health or NCD reduction policies with nutritional section were indicated, however only Kazakhstan, Kyrgyzstan, Moldova and Russian Federation have those documents available for public reading in English or Russian. This four evaluated policies did not state all goals aimed at reduction of nutritional risk factors. Therefore there is limited evidence to state that other indicated but not assessed policies contain or do not contain all the recommended nutritional options. From the assessment of the eleven available breastfeeding policies we can state that all countries, except for Ukraine have policies that target promotion of breastfeeding. Only four countries have regulations of marketing pressure reduction. Some countries have also indications for additional policies that target issues of school nutrition and food safety.

The global data reports show us that progress was made by the CIS in development of NCD policies and that by 2013 most countries had these documents in place or in development except for Georgia and Kazakhstan. Concerning nutrition policies that specifically address unhealthy diet, overweight and obesity in contrary, no progress is made. Due to limited evidence for the availability of separate national nutrition policy by all countries except for Russian Federation, we have defined 'nutrition action' as present if national health or NCD policy with nutrition section were identified. That indication of nutrition action, shows that all CIS countries except for Azerbaijan, Belarus Georgia and Ukraine state some nutritional policy actions. However, as mentioned earlier, this definition of nutrition action is of little contributive value for assessment of actual development in availability of nutritional policy. As we compare our results with results from global reports, we see that findings are similar. Global reports however does not indicate nutritional or NCD policy actions for Kazakhstan and NCD policy in development and absence of nutritional policy for Moldova and Uzbekistan. Our findings show that those country do encounter NCD nutritional actions in their national health policy. This could be explain by our broad definition of nutrition action.

In formulation of nutrition policy framework for the CIS (3.4) we accounted the following measures that are important to achieve progress in NCD surveillance: setting targets for breastfeeding coverage, marketing pressure reduction, intake of salt, sugar, fat and fruit and vegetable consumption. Additional measures that enable intersectoral collaborations and establishment of monitoring system are also included. This measures were

selected based on research findings that showed the following critical points. Despite the fact that breastfeeding policy options are properly adopted, the coverage of breastfeeding is still low. This could indicate the need for monitoring of proper implementation of this policies. Childhood overweight is poorly monitored in the CIS, but could potentially be increasing. Therefore measuring child overweight is important for surveillance on progress concerning reduction of marketing pressure and potential NCD dynamics. Continued measurements for intake of sugar, salt and fruit and vegetables and initial registration of fat intake is important to monitor progress in the CIS. Scaling up this risk factors should benefit understanding of main intake sources of those elements and provide opportunity to design targeted and cost-effective policy interventions. Salt intake exceeds the recommended amount in all twelve countries. Therefore policy options that target salt intake reduction are specifically prioritized for the CIS. We see also that despite variety in per capita sugar consumption between countries, almost half of the CIS consumes above global average of sugar. For those countries adoption of sugar reductive policy options are advised. Fruit and vegetable consumption seems to meet the minimum recommendations in all countries except for Georgia.

In sum this research showed that all CIS countries could benefit from development and adoption of appropriate nutrition policies that aim at NCD reduction. CIS countries should focus on implementation of policy options that apply population based interventions, due to their cost-effectiveness. Combination of policy options seem to deliver more health gain and have positive cost-effective profile in long term. Policies should support reduction of fat, sugar and salt intake, and marketing pressure; promote breast feeding and other healthy choices; establish multisectoral collaborations to reach sustainable results; and specify surveillance to monitor progress. To increase effectiveness of the suggested framework, countries are advised to take into account other contextual factors stated in chapter 2.4.

In researchers opinion progress is made in provision of recommendations and guidelines that should enable proper formulations of NCD reduction policies that include all relevant nutrition factors. However due to great availability of documents and frameworks that provide nutritional recommendations it could be challenging to extract all necessary policy measures from different sources that are relevant for region specific context. Framework presented in 3.4 can therefore be seen as a guide for the CIS governments in accounting those relevant measures. Second critical note observed are limitations in the availability of evidence that shows progress in monitoring relevant risk factors and inclusion of all nutritional policy measures conform international agreements by the CIS. We do recognize that it could be attributed to our search limitations, however presentation of available data could benefit monitoring progress and provision of targeted recommendations. Therefore future public presentation of monitoring indicators, related figures and policy documents by the CIS could benefit further research and provision of more specific recommendations.

5. Recommendations

Based on our research findings we have provided a set of recommendations that outline the nutritional priorities for the whole CIS region and specific countries. These recommendations should guide CIS governments in the use of the proposed nutrition policy framework (Chapter 3.4) and indicate prioritized actions in development and formulation of national nutrition policies.

For all CIS countries

- Implement general policy objectives and establish multisectoral collaborations
- Develop national nutritional policy that targets all nutritional risk factors of NCD reduction (except for Russian Federation) and include all advices policy options
- Monitor prevalence of childhood obesity to measure effectiveness of marketing pressure reduction measures.
- Monitor implementation of existing breastfeeding policies to increase coverage
- Measure populations fat intake (total, saturated and trans) and define main sources of intake
- Prioritize implementation of policy options aimed at salt reduction
- Support research on effective sugar limitation measures
- Continue to monitor fruit and vegetable consumption
- Prioritize use of population based interventions due to their cost-effectiveness (Tajikistan could also benefit from primary care interventions).
- Use other global and regional recommendations to expand your policy options (strongly encouraged)

Country Specific

- Republic of Belarus, Georgia and Ukraine should develop national health or NCD policy with policy options that target nutritional risk factors reduction actions.
- Azerbaijan and Belarus should register availability or status of their policy documents on governmental websites.
- Ukraine should develop separate breastfeeding policy conform global recommendations on infant and young child feeding.
- Kyrgyzstan, Kazakhstan, Georgia, Armenia, Ukraine, Russian federation and Republic of Moldova should prioritize policy actions aimed at reducing sugar intake.
- Georgia should apply policy options to increase fruit and vegetable consumption
- Russian Federation should monitor breastfeeding coverage (exclusive and continued)

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Databases

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Chartsbin public contribution database www.chartsbin.com

Legislation database for CIS http://www.spinform.ru/

Global Health Observatory Data Repository http://apps.who.int/gho/data

WHO Global database on the Implementation of Nutrition Action (GINA) https://extranet.who.int/nutrition/gina

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