



EMPHNET

The Eastern Mediterranean
Public Health Network



**PROJECTING THE PREVALENCE OF MAJOR
NON-COMMUNICABLE DISEASES / RISK
FACTORS FOR THE JORDANIAN YOUTH
POPULATION FOR THE YEARS**

2007 - 2050

**Amman - Jordan
2013**

This paper was prepared by the Eastern Mediterranean Public Health Network (EMPHNET) in fulfillment of its agreement with the Higher Population Council in Jordan. The results of this report were presented at TEPHINET Seventh Global Scientific Conference held in Amman, Jordan, 10-15 November, 2012.

PREFACE

The relentless spread of non-communicable diseases (NCDs) offers an opportunity for countries like Jordan to join forces with the rest of the World in addressing a major global challenge that threatens health and social economic development alike.

This issue poses a major concern for the Government of Jordan, which holds an obligation for diminishing premature deaths and disability in the country, especially among its youth population as the prevalence of chronic diseases such as (diabetes, hypertension and high cholesterol) and risk factors associated with these diseases (obesity, overweight and smoking) might witness an alarming increase by the year 2050, thus, resources and action plans should be in place to manage its prevalence.

Jordan's current hardship in allocating resources to deal with the burden of NCDs is challenged by the growing demand on health care cost, especially costs involving care due to changes in the population structure. The country is undergoing a demographic transition that is bound to bring on considerable increase in the youth population over the next two decades as a result of certain projected scenario's due to changes in fertility. If there is an increase in the prevalence of NCDs, a considerable number of Jordanians between the ages of 18 and 34 will be diagnosed with hypertension, diabetes, high cholesterol and more will be obese.

Young people (18 - 34 years old) are currently estimated to be 36% of the Kingdom's population (representing approximately 2.3 million people) and are the core group for future growth with noticeable important contributions to economic and social development progress. Hence, the increased prevalence of chronic diseases and their risk factors among the youth population will affect their productivity considerably.

Therefore, conducting epidemiologic studies that provide estimated disease projections for NCDs in Jordan, particularly among youths, will present health planners, decision makers, and researchers with evidence for strengthening the public health system by addressing future disease threats that influence the quality of life in the kingdom.

As a major player in population health and development, the Higher Population Council (HPC) collaborates with various stakeholders and partners in Jordan to maintain a balance between population growth and resource utilization. In this context, the HPC collaborated with the Eastern Mediterranean Public Health Network (EMPHNET) in estimating projections for the prevalence of major NCDs and their related risk factors for the Jordanian youth population (18-34) for the years 2007-2050. The technical support provided by EMPHNET was enhanced by involving the Technical Team of the National Population Projection Committee thus maximizing collaboration for the sake of avoiding duplication and ensuring impartiality.

The estimated projections for the prevalence of major NCDs among the youth population in Jordan present a set of findings and recommendations in a proactive way that we believe will provide policy makers, service providers, research-funding agencies and donors with adequate evidence to support the development of future health strategies. Such strategies will definitely lead to appropriate interventions that will guarantee success in dealing with the estimated increase in the prevalence of NCDs and their preventable risk factors.

I would like to express my gratitude and appreciation to the various organizations, individuals and staff members who participated in course of this study. I offer particular acknowledgement to EMPHNET for providing technical assistance in preparing the estimates and the report.

We pray to the Almighty to keep on giving us the chance to contribute to the progress of our beloved country under the wise leadership of His Majesty King Abdullah II Ibn Al-Hussein. May GOD Bless and Keep Him always.

Prof. Dr. Raeda Al Qutob



Secretary General

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I. INTRODUCTION

Jordan is undergoing a demographic transition that is bound to bring on considerable increase in the youth population over the next two decade. The last population census (2004) done in Jordan indicated that the age structure of the Jordanian population has changed considerably since 1979 as a result of changes in fertility, mortality, and migration dynamics. The proportion of the population under 15 years of age declined from 51% in 1979 to 37% in 2004, while life expectancy continues to increase reaching 74 years for females and 71 for males [1]. In addition, despite its steady decline in recent years to reach 3.8 in 2009 the total fertility rate (TFR) remains relatively high in Jordan, [2]. The declining mortality rate and the high total fertility rate have contributed to the average annual population growth rate of 2.2% in 2011 [1]. Jordan's 2011 estimated population number 6,249,000 comprised of 36.9% under 15 years, 59.6% between 15 to 64 years and 3.5% over 65 years [2].

While Jordan's population has doubled over the last 20 years, demographic projections indicate that this population will most likely double again by year 2035. Changes in the number of Jordan's population will be most prominent in the working age population which will definitely double over the coming few decades. Therefore, it's of utmost importance that policy makers and health planners address the growing needs of Jordan's population particularly those of the younger age groups in order to guide and direct resources and assure high quality of life [2,3].

At the same time, Jordan is experiencing an epidemiological transition where infectious diseases are declining and chronic diseases, such as cancers, are becoming more predominant [4]. The causal relationships between food, nutrition and physical activity and non-communicable diseases are well established. Sedentary lifestyle, high fat diet, and smoking are becoming common in Jordan [5, 6]. Currently, approximately half of deaths in Jordan are attributed to NCDs, namely, cardiovascular

diseases, diabetes, and cancer, [7].

Worldwide, the burden of non-communicable diseases (NCDs) is escalating posing a major current and future public health challenge [8, 9]. Mortality, morbidity and disability attributed to NCDs account for about 60% of global deaths and nearly half of the global burden of disease [10, 11, 12]. Approximately 80% of deaths attributed to NCDs occur in low- and middle-income countries [8].

Results of the latest (2007) National Jordan's Stepwise Surveillance survey conveyed that nearly one-third of participants (≥ 18 years) smoked cigarettes and 19% were diagnosed with diabetes according to laboratory testing. Approximately one-third of participants of the medical evaluation were either overweight (30%) or obese (36%) [13].

This report presents projection of selected NCDs and risk factors and their implications for the youth population of Jordan based on nationally adopted population projections done by the Higher Population Council [14].

II. PURPOSE

The importance of preventing and controlling NCDs in Jordan is vital when considering the imminent changes in the population structure. Calculations of NCD estimates can yield major gains in population health by quantifying future disease prevalence in an attempt to reduce the burden of NCDs and their risk factors. The overall purpose of this study was to address the need for morbidity projections in Jordan by providing projections of future trends related to most common NCDs, mainly: diabetes mellitus (type 2), hypertension, high cholesterol and obesity. Projections for NCD data figures will assist the efforts made to strengthen the public health system in Jordan by ensuring availability of strategic epidemiologic information to major stakeholders, particularly research entities and the Ministry of Health.

III. OBJECTIVES

This study was planned with the intention of promoting the use of information and data among health service planners and policymakers in Jordan. The study aimed at generating and providing projections for the prevalence of major non-communicable diseases (NCDs) and risk factors among Jordanian youth aged 18-34 years using data from the 2007 Stepwise surveillance survey and applying it to the nationally adopted population projections data developed by the Higher Population Council in 2009.

Estimates and projections of diseases in Jordan can contribute to better understanding of population needs and trends in the next few decades. This study was guided by the following objectives:

- Empower health service planners with information that have implications for planning and policy making.
- Estimate the prevalence rates for diabetes, hypertension, high cholesterol and obesity among the youth population, and their specific trends in the next 40 years in Jordan (up until year 2050)
- Highlight important recommendations for policymakers and public health program planners to reduce the burden of NCDs based on future trends of the most common chronic diseases and risk factors in Jordan: diabetes, hypertension and major risk factors: high cholesterol and obesity
- Provide projection models for the youth population (18 – 34 years) with different population projections scenarios: constant fertility levels , optimistic and pessimistic

This report was prepared and disseminated at TEPHINET Seventh Global Scientific Conference held in Amman, Jordan. The results were presented in a session on NCDs in Jordan.

IV. PROJECTION METHODOLOGY

The projection model used in this study included the following tasks: 1) generating baseline prevalence estimates of Hypertension, Diabetes Mellitus, High Cholesterol, Overweight and Obesity for the Jordanian youth population; 2) outlining assumptions about the future of NCDs (projection models) and 3) projecting the numbers of youth with selected NCDs and risk factors under different population projections scenarios. The following sections describe the data sets, morbidity/risk factor measures and the procedures used to generate baseline data, the morbidity prevalence scenarios and the projection methodology.

IV-1 Data Set

During 2007, the Jordan Ministry of Health conducted its third Stepwise Household Surveillance Survey. The survey selected a nationally representative sample of adults aged 18 years or older. A multistage sampling design was used to select households, from which one person was randomly selected to participate in the survey. The sample was stratified by urbanity (urban and rural) and by region (North, Middle, and South). In total 3,688 households were selected and 3654 adults were interviewed, yielding a response rate of 99.1%. A subsample of 889 subjects was invited to participate in a physical examination and laboratory assessment, of whom 765 responded, yielding a response rate of 86.1%. Data for the current report were limited to the age group 18-34 years of this subsample (n= 674).

IV-2 Measurement of Disease/Risk Factor

The participants of the studies age group were evaluated at a local health center where blood pressure, height, weight, and waist circumference were obtained. A blood sample was obtained from each after an overnight fast and sent to a central laboratory where many measurements

were performed including total cholesterol and fasting blood glucose. Standardized training was provided to all attending physicians of the participating local health centers on all study procedures. Height and weight were measured by the participating physicians using a standard technique. The survey took place between June 1st and August 23rd 2007.

For persons participating in the medical examination, body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared. Participants were classified as normal weight if their BMI was $<25 \text{ kg/m}^2$, overweight if their BMI was between 25 kg/m^2 and 29.9 kg/m^2 , and obese if their BMI was $\geq 30 \text{ kg/m}^2$. Blood cholesterol (HBC) was classified as <200 (desirable), 200-239 (moderately elevated), and 240+ mg/dL (hypercholesterolemia); high blood pressure (HBP) as systolic blood pressure ≥ 140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg, impaired fasting glucose (IFG) from 100 mg/dL to 125 mg/dL, and diabetes as >125 mg/dL. In addition, subjects receiving lipid lowering medications, antihypertensive medications, and insulin or oral hypoglycemic medication, were considered as having HBC, HBP, or diabetes, respectively, irrespective of their measured values at the time of the survey.

IV-3 Population Projection

This study uses population projection data that was prepared by the Higher Population Council (HPC). Two scenarios presented by HPC were used when modeling disease/risk factor projections. The first scenario used was the constant scenario which assumes no change in the TFR value (3.8) throughout the projection period (2009- 2050) referred to as (high population) . The second scenario used was the intermediate scenario, which assumes a decrease in the Total Fertility Rate of about 0.1 annually during the period 2009-2017, then a decrease of about 0.05 annually till the rate reaches 2.5. then the decrease will be 0.025 annually. When the rate reaches a value of 2.1 it will be constant till the end of the projection period in the year 2050. [18]

IV-4 Projection Models

We computed crude estimates for the prevalence of NCDs and risk factors. We analyzed hypertension, diabetes, high blood cholesterol, overweight and obesity. For each disease or risk factor, population numbers projected for the selected two population scenarios prepared by the HPC were multiplied by the risk factor prevalence estimates to obtain the projected population with hypertension, diabetes, hypertension, overweight, and obesity for each year and based on the four models included in Table 1.

Table1: Description of Projection Models		
Model	Description	Prevalence Rate Assumption
Constant Model	Continuation of 2007 prevalence rates of disease or risk factor.	Model assumes that current prevalence rates will remain constant in the future. Prevalence rates in 2007 are applied to the two scenarios of the population projections calculated by the Higher Population Council (HPC).
Minimal Model	Minimal steady increase in prevalence rate of disease or risk factor.	Model Starts with the 2007 estimated prevalence and applies a 0.1 percentage point annual increase to the projected disease estimates. Assumptions made until year 2050. Prevalence rates in 2007 are applied to the two scenarios of the population projections calculated by the Higher Population Council (HPC).
Moderate Model	Moderate steady increase in prevalence rate of disease or risk factor.	Model Starts with the 2007 estimated prevalence and applies a 0.25 percentage point annual increase to the projected disease estimates. Assumptions made until year 2050. Prevalence rates in 2007 are applied to the two scenarios of the population projections calculated by the Higher Population Council (HPC).
Extreme Model	Minimal steady increase in prevalence rate of disease or risk factor.	Model Starts with the 2007 estimated prevalence and applies a 0.5 percentage point annual increase to the projected disease estimates. Assumptions made until year 2050. Prevalence rates in 2007 are applied to the two scenarios of the population projections calculated by the Higher Population Council (HPC).

The projected estimates for disease/risk factors among the youth population for the above four models were carried out for the constant and intermediate population projections scenarios. Version 10 of STATA statistical software (STATA Corporation, College Station, Texas, USA) was used in analyses to accommodate for the complex survey sampling design. Furthermore, the National Projection Committee that reviews and approves any national population projection was consulted on the methodology used in this study in an attempt to approve the results and get them adopted by the national authorities.

V. MODEL ESTIMATES

Developing alternative models that allow for change in the prevalence of disease or risk factors over the path of the projected period is important for portraying the range of estimates generated by the different scenarios. Table 2 displays the prevalence rates of diagnosed diabetes, hypertension, hypercholesterolemia, overweight, and obesity based on type of verification. The diagnosed prevalence of hypertension and diabetes among Jordanian youth aged 18 years to 34 years were 4.5%. 6.2% respectively. High blood cholesterol level was prevalent among 5.2%. Based on measured weights and heights of participants, more than one-fourth (28.8%) were labeled as overweight while the prevalence of obesity was 18.2%,

TABLE 2: Baseline (2007) Disease and Risk Factor Proportions Among Jordanian Youth Aged (18-34) according to method of verification	
Category	% (SE*)
<i>High blood pressure</i>	
Self-reported	4.3(1.45)
Measured	4.1(1.41)
<i>Measured and prescribed medications</i>	<i>4.5(1.43)</i>

<i>Diabetes (Type 2)</i>	
Self-reported	1.2(1.6)
Measured	5.2(2.1)
<i>Measured and prescribed medications</i>	6.4(2.5)
<i>High blood cholesterol</i>	
Self-reported	1.1(0.38)
Measured	4.8(1.52)
<i>Measured and prescribed medications</i>	5.2(1.63)

*SE – Standard Error

The projection estimates of disease/risk factor estimates were calculated for the four different models described above using the 2007 prevalence estimates that were based on actual condition measurement or use of medication (Table 2), Calculations were done for the constant (high population) and intermediate population scenarios. Although the magnitude of annual prevalence increments were chosen arbitrarily, evidence from Jordan show that the prevalence of various non-communicable diseases and risk factors have increased dramatically over time. Accordingly, Ajlouni et al (2007) reported that there has been a significant increase in the prevalence of diabetes in Jordan between 1994 and 2004 from 13% to 17% [16]. Furthermore, Jaddou et al (2000) reported the prevalence of hypertension in Jordan in 1995 to be 16.3%. In another publication by Jaddou et al (2011) the prevalence of hypertension during 2009 was reported to be 32% [17]. Moreover, Brown et al (2009) used the same model estimates that we used in this report [6].

The models are graphically presented in Annex 1 based on the projected numbers tabulated in Annex 2. The relative change in the prevalence of the projected youth population generated by the four models for each of the disease/risk factor for selected years using the constant fertility and intermediate fertility reduction scenarios are displayed in Tables 3 and 4.

TABLE 3 : Relative Change in Projected Numbers of Youth with Different Disease/Risk Factor in Jordan, in Selected Years using Four Models

According to the High Population Projection Scenario

Projected Year	Hypertension	Diabetes	High Cholesterol	Overweight	Obesity
CONSTANT					
2010					
2020	0.20	0.20	0.20	0.20	0.20
2030	0.13	0.13	0.13	0.13	0.13
2040	0.26	0.26	0.26	0.26	0.26
2050	0.23	0.23	0.23	0.23	0.23
MINIMAL MODEL					
2010					
2020	0.45	0.37	0.41	0.24	0.26
2030	0.33	0.28	0.31	0.17	0.19
2040	0.44	0.40	0.43	0.30	0.32
2050	0.39	0.36	0.38	0.27	0.29
MODERATE MODEL					
2010					
2020	0.77	0.61	0.70	0.30	0.35
2030	0.50	0.43	0.47	0.22	0.27
2040	0.57	0.52	0.55	0.35	0.39
2050	0.47	0.44	0.46	0.31	0.35
EXTREME MODEL					
2010					
2020	1.28	0.95	1.09	0.39	0.50
2030	0.67	0.57	0.62	0.29	0.36
2040	0.67	0.61	0.64	0.42	0.47
2050	0.53	0.50	0.52	0.37	0.41

TABLE 4: Relative Change in Projected Numbers of Youth with Different Disease/Risk Factor in Jordan, in Selected Years using Four Models					
According to the Intermediate Population Projection Scenario					
Projected Year	Hypertension	Diabetes	High Cholesterol	Overweight	Obesity
CONSTANT					
2010					
2020	0.20	0.20	0.20	0.20	0.20
2030	0.13	0.13	0.13	0.13	0.13
2040	0.11	0.11	0.11	0.11	0.11
2050	0.01	0.01	0.01	0.01	0.01
MINIMAL MODEL					
2010					
2020	0.45	0.38	0.41	0.24	0.26
2030	0.32	0.27	0.30	0.16	0.18
2040	0.28	0.24	0.26	0.15	0.17
2050	0.14	0.12	0.13	0.04	0.06
MODERATE MODEL					
2010					
2020	0.77	0.62	0.70	0.30	0.36
2030	0.31	0.42	0.46	0.21	0.26
2040	0.42	0.34	0.37	0.19	0.23
2050	0.23	0.19	0.20	0.08	0.11
EXTREME MODEL					
2010					
2020	1.29	1.33	1.09	0.39	0.38
2030	0.66	0.49	0.61	0.29	0.47
2040	0.47	0.39	0.45	0.25	0.30
2050	0.26	0.21	0.25	0.12	0.16

As expected, using the constant fertility rate scenario (high population) in modelling the projected number of youth with disease or risk factor yielded less numbers than what is observed in the intermediate population projections scenario. This is basically due to a lower number of youth in the population when projecting the population number against a constant TFR as opposed to a TFR that is reduced over time.

Alternatively, examining the projected numbers of youth population irrespective of the population projection scenarios reflect high numbers of affected youth that require active response.

VI. STRENGTHS AND LIMITATIONS

To the best of our knowledge, this is the first study in Jordan that attempts to project the burden of NCDs and risk factors among youths. Using the nationally adopted population projection data that were published by HPC gives strength to the study in that these population projections are recognized by the government as the only approved source. The approval of the National Population Projection technical committee headed by the Department of Statistics of the youth NCDs and risk factors projection is another strength of this study. Furthermore, employing national survey data in conducting disease and risk factor projections provides strength to the study by bringing in representativeness, accuracy and reliability. Hence, the calculated prevalence used as a base for modeling diseases and risk factors in this study are closer to true estimates, since the prevalence of various risk factors/diseases was based on actual height and weight measurements and laboratory assessment.

On the other hand we are aware that many people might have more than one risk factor or disease at the same time. In addition, and despite the efforts made to base the annual prevalence increments on evidence based grounds, we feel that this may pose a limitation to this study. The small sample size didn't allow for calculating differentials according to age groups and sex.

VII. POLICY AND RESEARCH IMPLICATIONS

Projected estimates presented in this study indicate an alarming situation with clear policy and research implications. Even though the increase in disease and risk factor prevalence was a given assumption

when defining the two projection models, the noticeable increase in the numbers of youth estimated to have hypertension, diabetes, high cholesterol, overweight or obesity is considered important. Results indicated that even if the prevalence for these diseases and risk factors stays constant, the numbers grow profoundly especially for Diabetes, overweight and obesity. It is worth noticing that regardless of which scenario is considered, the projected number of overweight and obese youth increases significantly by year 2020 and thereafter.

The results present a challenge for policy makers and health planners particularly in relation to preventing NCDs and controlling their risk factors. Following is a summary of the major recommendations:

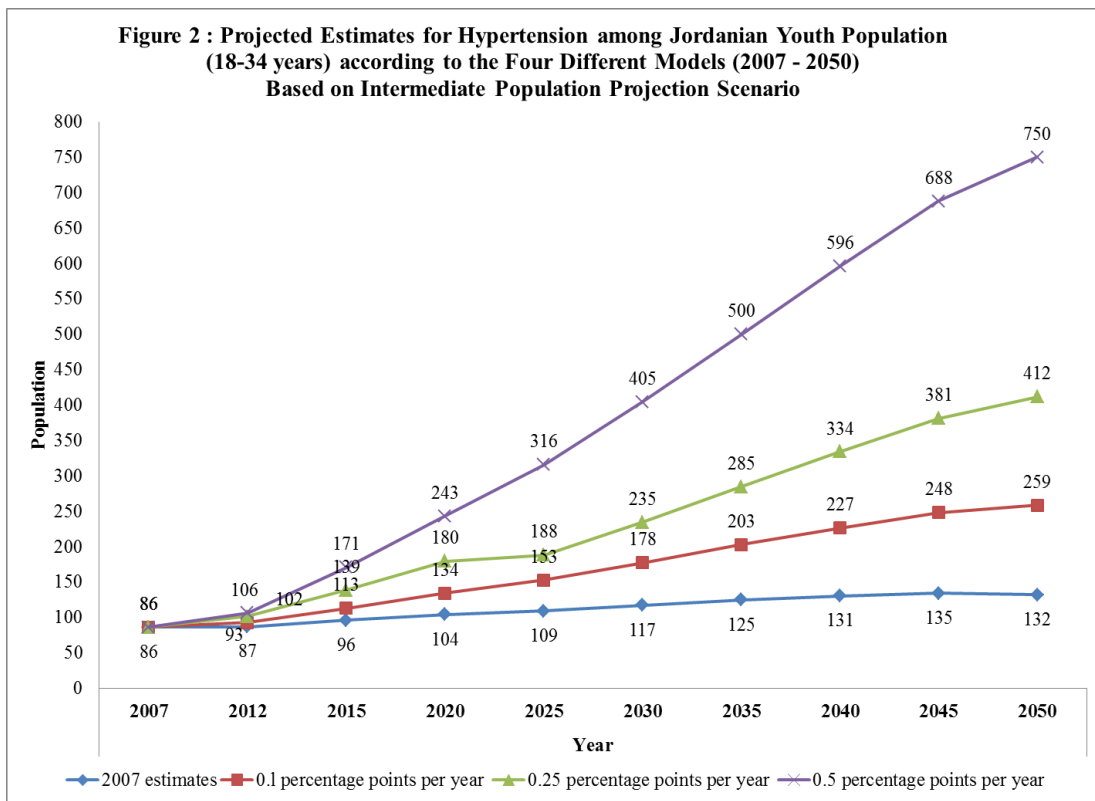
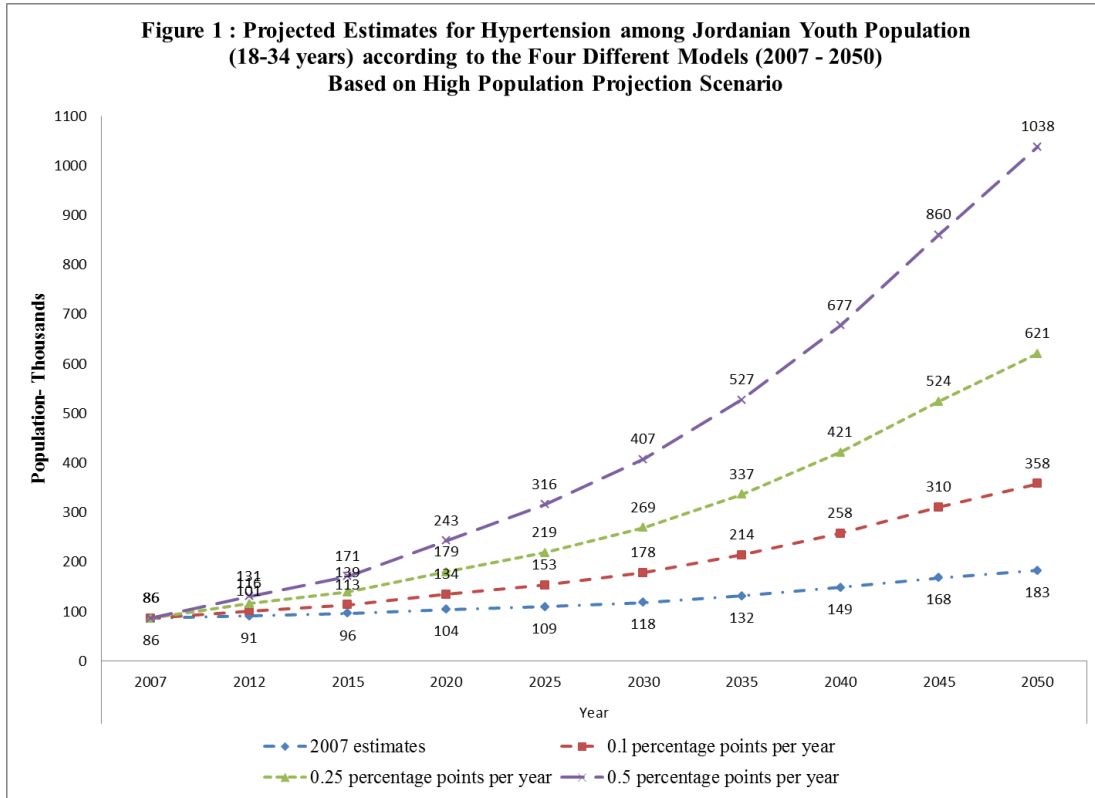
- Expand the use of generated projections by incorporating costing with the disease prevalence estimates and any other issue that is significant to decision making.
- Develop public health policy that can facilitate preparedness to the disease prevalence among the youth.
- Conduct research studies to explore NCD risk factors among the youth population and new health promotion options that take the cultural changes of the youth.
- Explore new approaches for introducing early prevention and detection of NCDs among the youth population.

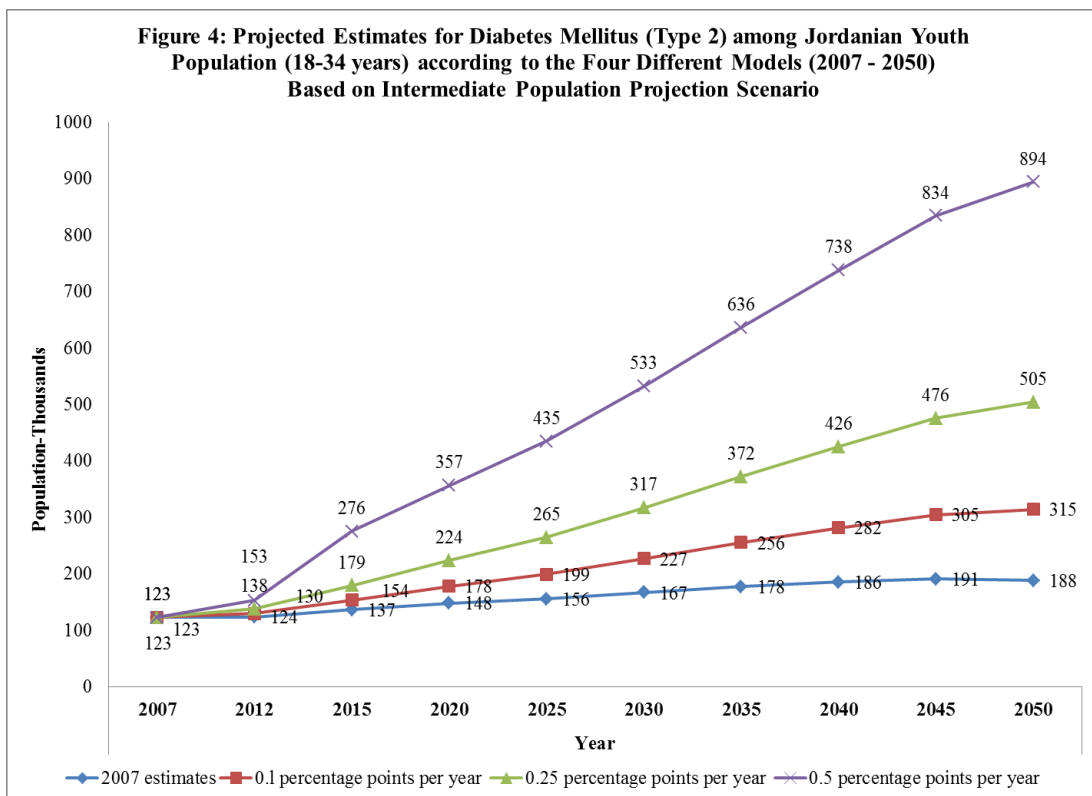
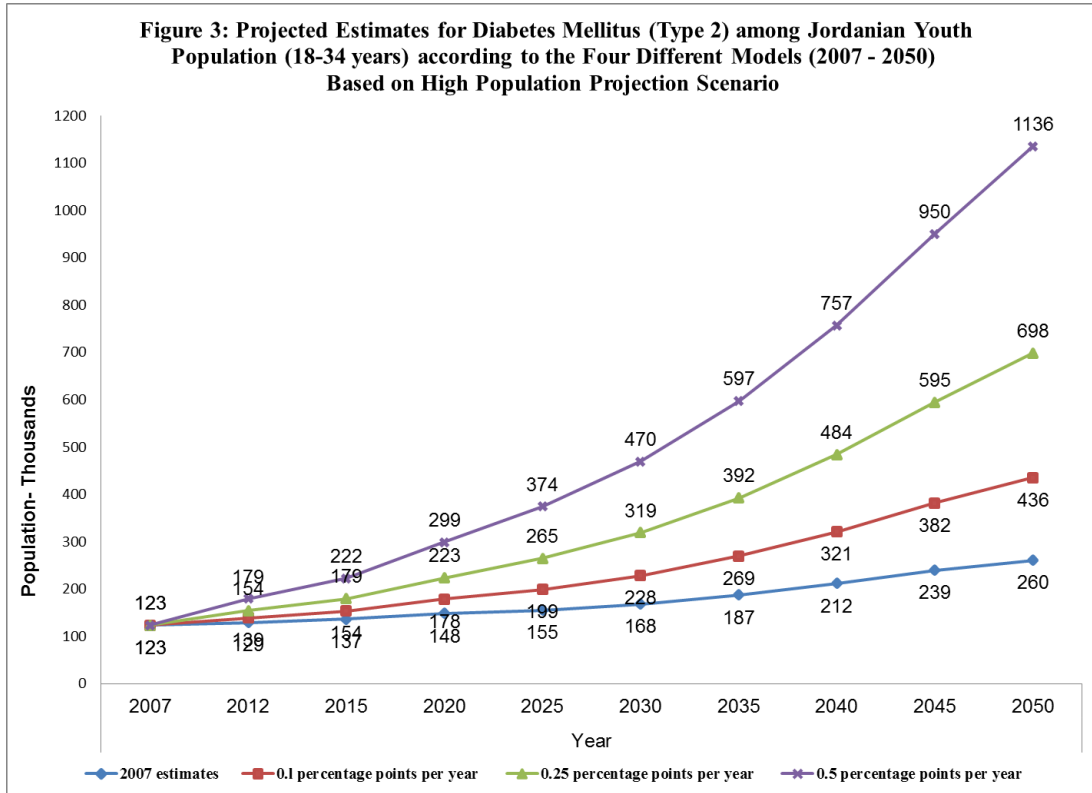
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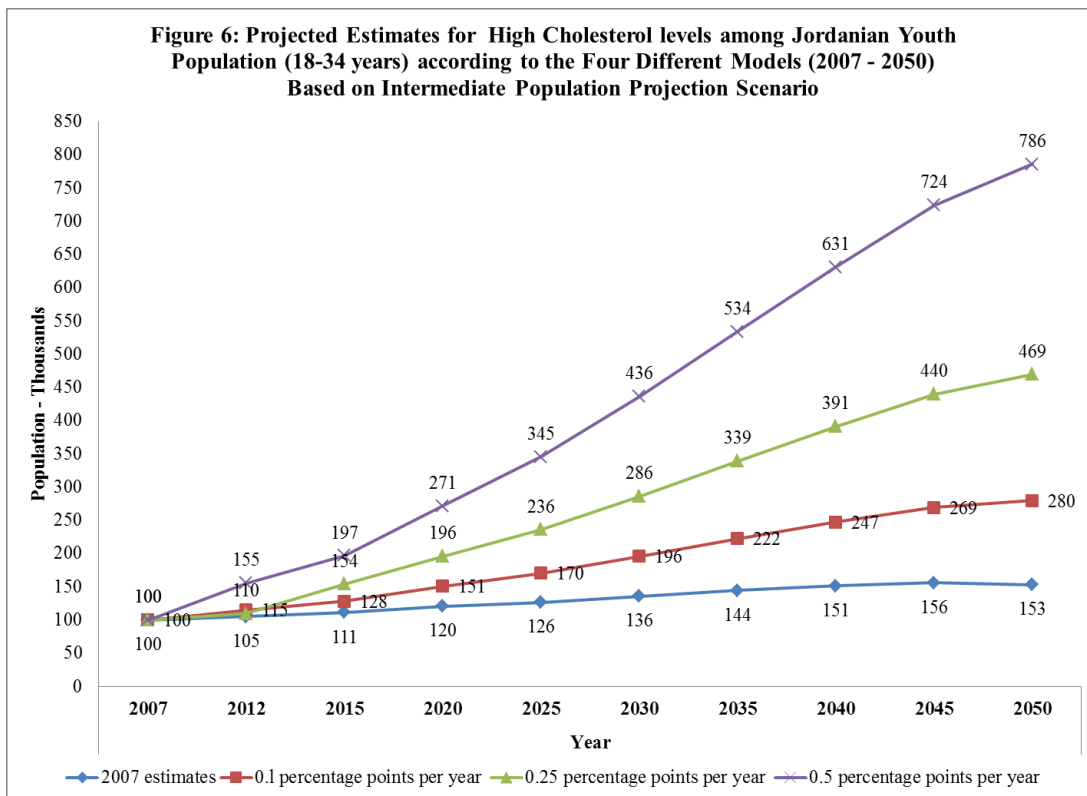
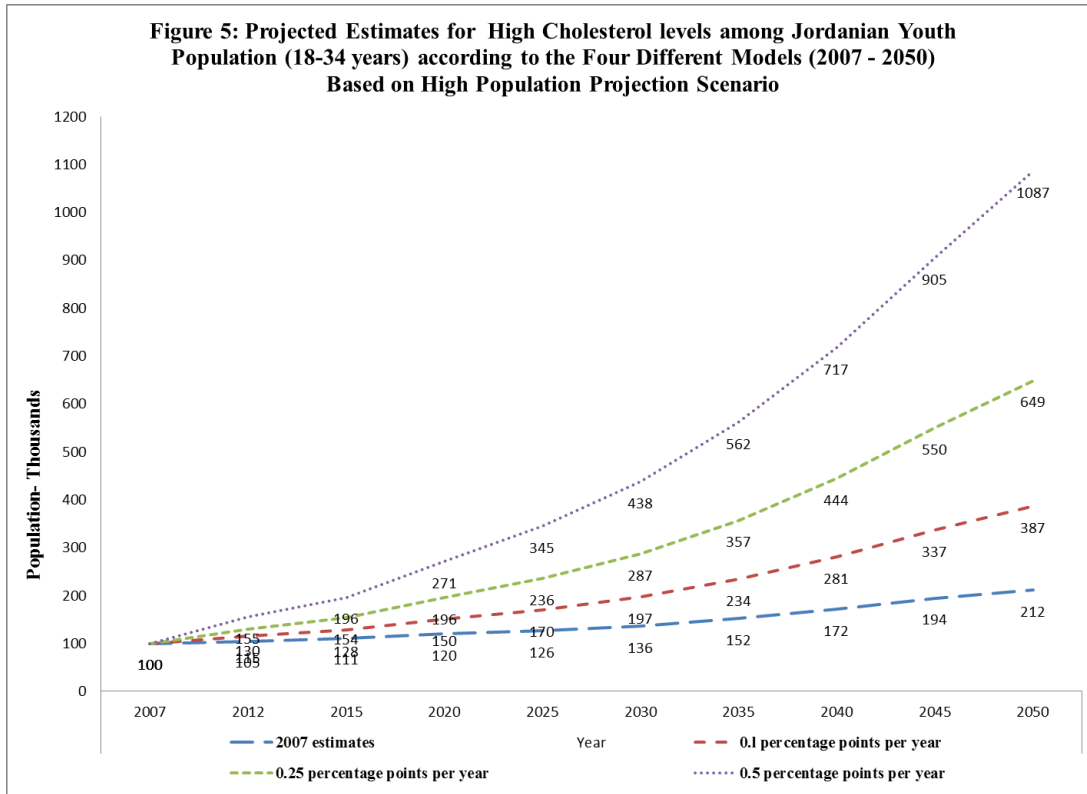
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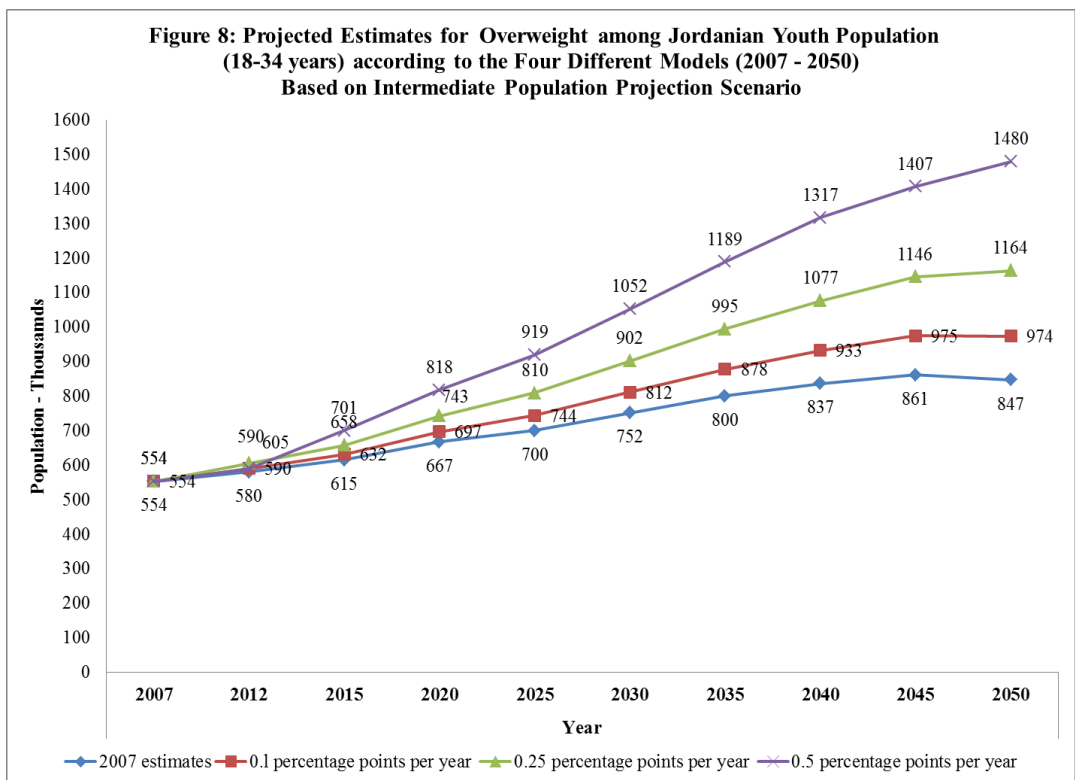
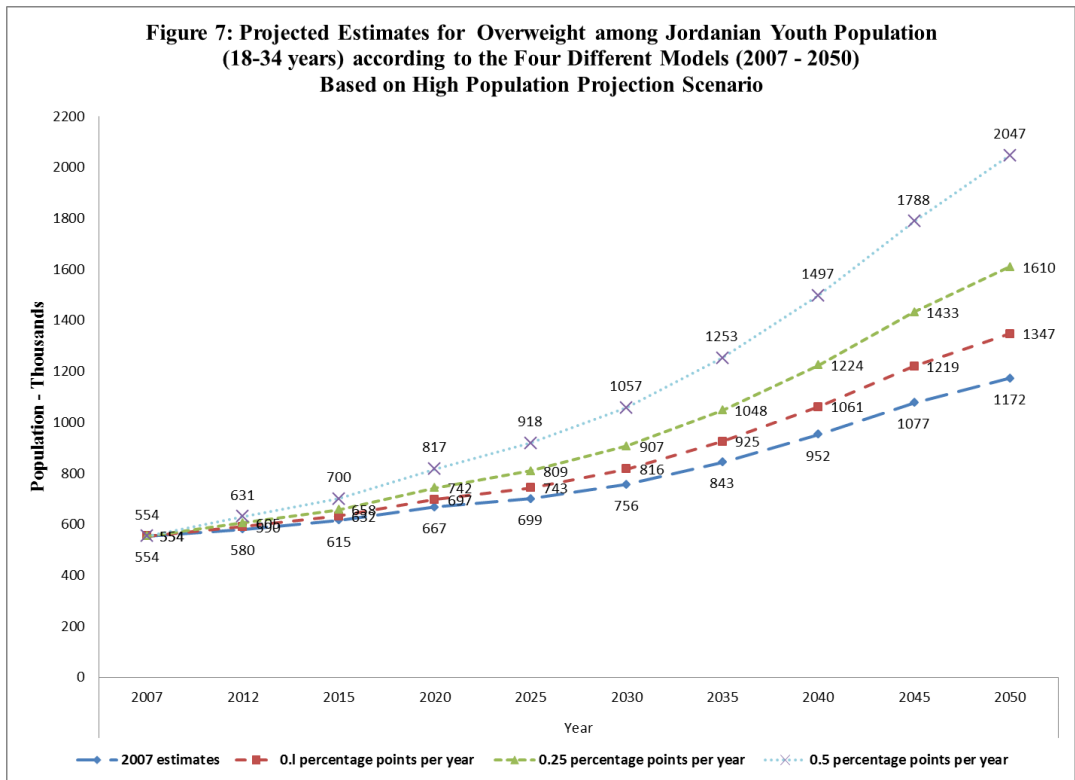
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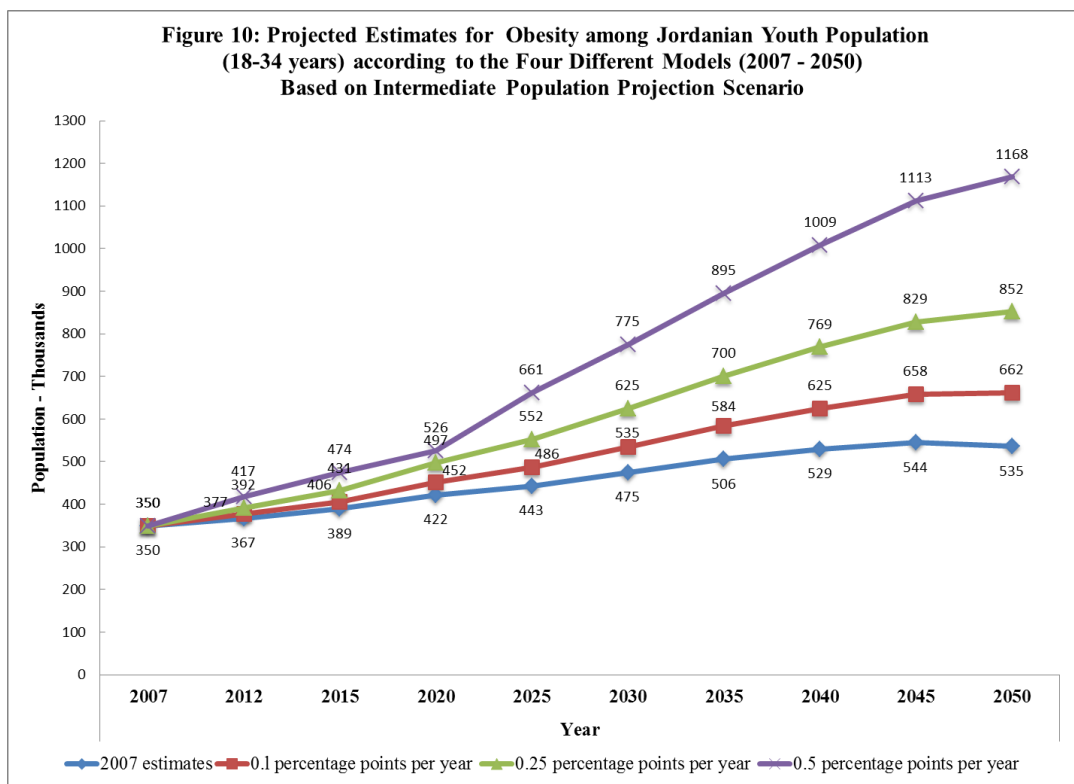
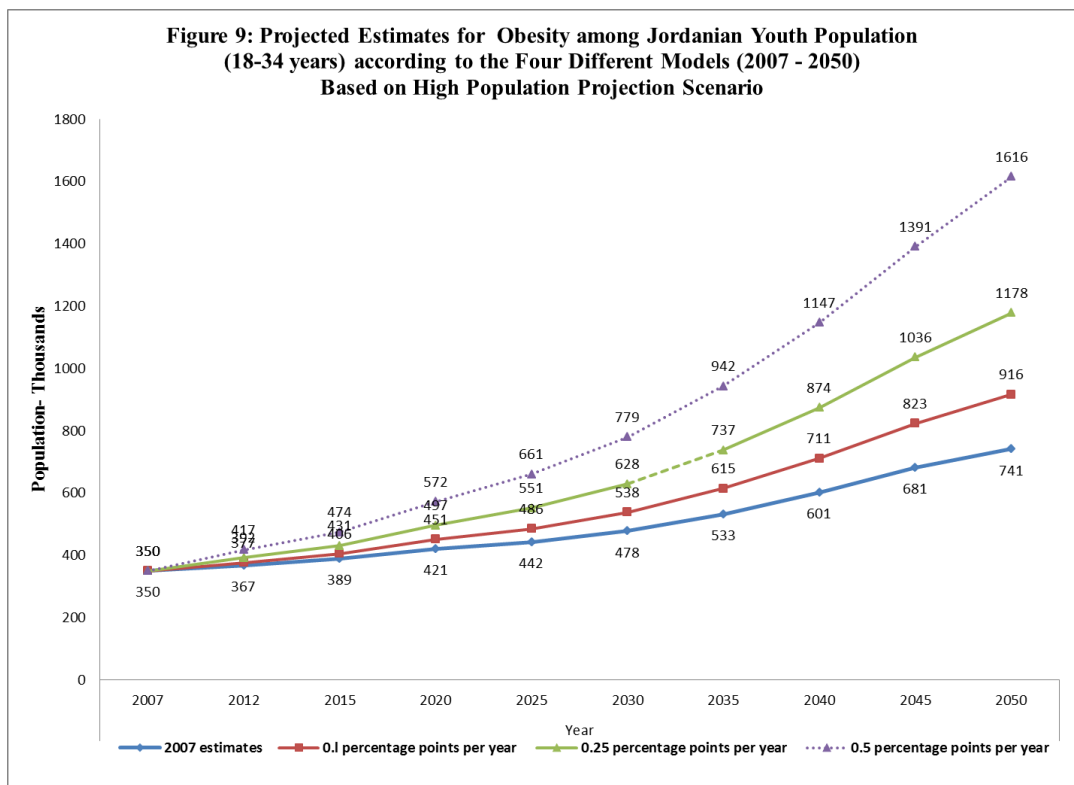
ANNEX 1











ANNEX 2

Table 5: Projected Numbers of Youth with different Disease/Risk Factors in Jordan in Selected Years using Four Projection Models According to the constant (high Population) Projection Scenario

Model	Disease	2007	2012	2015	2020	2025	2030	2035	2040	2045	2050
Constant	HTN	86489	90649	96100	104189	109296	118079	131691	148711	168311	183159
	DM	123007	128922	136676	148180	155444	167935	187294	211500	239376	260493
	Cholesterol	99943	104750	111049	120396	126298	136447	152177	171844	194493	211651
	Overweight	553533	580151	615043	666810	699497	755708	842825	951752	1077192	1172220
	Obesity	349802	366623	388673	421387	442043	477565	532619	601454	680725	740778
Minimal											
	HTN	86489	100721	113185	134288	153015	178431	213633	257766	310441	358178
	DM	123007	138995	153761	178279	199162	228287	269236	320555	381505	435512
	Cholesterol	99943	114822	128134	150495	170017	196799	234118	280899	336622	386670
	Overweight	553533	590223	632128	696909	743216	816059	924766	1060807	1219321	1347240
Moderate											
	HTN	86489	115829	138812	179437	218593	268958	336545	421348	523635	620707
	DM	123007	154103	179388	223428	264740	318814	392148	484138	594700	698041
	Cholesterol	99943	129930	153761	195644	235594	287326	357030	444481	549817	649198
	Overweight	553533	605331	657754	742057	808793	906587	1047678	1224389	1432515	1609768
Extreme											
	HTN	86489	130937	170845	243108	315745	406718	526766	677462	860257	1037904
	DM	123007	179283	222099	298675	374037	469693	597001	756775	950023	1135589
	Cholesterol	99943	155110	196472	270892	344891	438205	561883	717119	905140	1086746
	Overweight	553533	630512	700466	817305	918090	1057466	1252532	1497026	1787839	2047316
	Obesity	349802	416984	474096	571882	660636	779324	942325	1146729	1391373	1615873

*Calculations based on Jordan's population data projections prepared by the Higher Population Council – High population projection scenario, using the 2007 National Prevalence Survey Results

Table 6: Projected Numbers of Youth with different Disease/Risk Factors in Jordan in Selected Years using Four Projection Models According to the Intermediate Population Projection Scenario (optimistic)

Model	Disease	2007	2012	2015	2020	2025	2030	2035	2040	2045	2050
Constant	HTN	86489	87090	96124	104260	109430	117479	125045	130791	134594	132398
	DM	123007	123861	136709	148280	155634	167081	177842	186014	191423	188299
	Cholesterol	99943	100637	111076	120478	126453	135753	144496	151137	155531	152993
	Overweight	553533	557374	615191	667261	700355	751863	800288	837064	861404	847344
	Obesity	349802	352229	388767	421672	442585	475136	505737	528978	544360	535475
Minimal	HTN	86489	92896	113212	134379	153203	177523	202851	226705	248252	258911
	DM	123007	129667	153798	178400	199407	227125	255647	281928	305081	314812
	Cholesterol	99943	106443	128165	150597	170225	195798	222302	247050	269189	279506
	Overweight	553533	563180	632280	697380	774524	857594	919775	976575	1019927	1025346
	Obesity	349802	358035	416536	463376	498517	548234	597437	639424	672972	676699
Moderate	HTN	86489	101605	138845	179558	188464	234957	284825	334244	381351	411904
	DM	123007	138376	179431	223579	265065	317192	372356	425798	475567	504582
	Cholesterol	99943	115152	153798	195776	235883	285865	339011	390920	439675	469276
	Overweight	553533	571889	657913	742559	809785	901975	994802	1076848	1145548	1163627
	Obesity	349802	366744	431488	496970	552016	625247	700252	768762	828503	851758
Extreme	HTN	86489	116120	181567	254857	328291	424228	521021	617625	725314	787030
	DM	123007	152891	275554	356799	435290	532570	636340	738244	834485	894419
	Cholesterol	99943	129667	196519	271075	345314	435976	533525	630704	723819	785559
	Overweight	553533	586403	700634	817858	919216	1052086	1189317	1316632	1407259	1479911
	Obesity	349802	381259	474210	525931	661446	775359	894766	1008546	1112647	1168041

*Calculations based on Jordan's population data projections prepared by the Higher Population Council – Intermediate population projection scenario, using the 2007 National Prevalence Survey Results

Table 7: Projected Numbers of Youth with different Disease/Risk Factors in Jordan in Selected Years using Four Projection Models According to the pessimistic Population Projection Scenario

Model	Disease	2007	2012	2015	2020	2025	2030	2035	2040	2045	2050
Constant	HTN	86489	90657	96131	104281	109478	117568	125206	129094	127988	121865
	DM	123007	128935	136719	148311	155701	167207	178071	183601	182027	173319
	Cholesterol	99943	104760	111084	120503	126507	135856	144683	149176	147897	140822
	Overweight	553533	580207	615237	667400	700656	752433	801319	826203	819124	779935
	Obesity	349802	366658	388796	421760	442776	475496	506389	522115	517641	492875
Minimal											
	HTN	86489	100730	113221	134407	153269	177658	203112	223763	236067	238313
	DM	123007	139008	153809	178437	199492	227297	255977	278270	290106	289767
	Cholesterol	99943	114833	128174	150629	170298	195946	222589	243845	255976	257270
	Overweight	553533	590280	632327	697526	744447	812523	879225	920873	927202	896383
	Obesity	349802	376732	405886	451886	486567	535586	584295	616784	625719	609324
Moderate											
	HTN	86489	95694	138856	179596	188545	235135	285192	329908	362633	379135
	DM	123007	154117	179444	223625	265179	317433	372836	420274	452224	464440
	Cholesterol	99943	109796	153809	195817	235985	286081	339448	385848	418094	431943
	Overweight	553533	605389	657962	742715	810134	902658	996084	1062876	1089321	1071056
	Obesity	349802	391841	431520	497074	552253	625721	701154	758788	787838	783997
Extreme											
	HTN	86489	130949	170899	243323	316268	404955	500824	588096	654161	690567
	DM	123007	179300	222169	298940	374656	467658	567601	656946	722421	755562
	Cholesterol	99943	155125	196534	271131	345462	436307	534213	622521	688291	723065
	Overweight	553533	590280	700687	818029	919611	1052883	1190849	1299549	1338186	1362178
	Obesity	349802	417024	474245	572388	661731	775946	895919	995460	1058035	1075118

*Calculations based on Jordan's population data projections prepared by the Higher Population Council – Low population projection scenario, using the 2007 National Prevalence Survey Results