National Program for Quality Indicators in Community Healthcare in Israel Report

2012-2014

Supported by:

Ministry of Health, State of Israel

The Israel National Institute for Health Policy Research

Health Council

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ACKNOWLEDGEMENTS

FOREWORD

"Efforts to improve quality require efforts to measure it."[1]

The *National Program for Quality Indicators in Community Healthcare in Israel Report* is produced in coordination with the four health plans in Israel (*kupot cholim*). The purpose of this report is to evaluate the quality of community-based medical care in Israel, including improvements and modifications to the healthcare system introduced over time, and variations in quality of care between subgroups.

The first program report was published in 2004 for data from 2001–2003. Annual reports were published thereafter for data through 2013 [2]. This current report presents results of indicators for the measurement years 2012–2014.

Quality indicators in this report are derived from data provided by the four health plans in Israel. The national quality indicators focus on health and wellness and disease management within eight major clinical fields. All data presented in the report underwent internal review, as well as external auditing by an accredited professional.

We hope the information in this report will benefit the general public, healthcare providers, and policy makers.

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INTRODUCTION

The healthcare system in Israel places great importance on quality. Healthcare quality can be defined as a measure of the extent to which healthcare providers improve the probability of desired health outcomes in accordance with current professional literature [3].

Healthcare quality comprises various elements, including:

- Effectiveness – improving health as a result of treatment,

- Safety – preventing harm to patients as a result of faulty treatment,

- Timing – beginning treatment at the right time and for the right length of time,

- Suitability – consideration of preferences, needs, and patient values,

- Efficacy – efficiently using available resources to ensure high quality treatment, and

- Equality – guaranteeing an equal quality of treatment, unaffected by personal variables such as sex, ethnicity, and socio-economic status.

In 1995, Israel implemented the National Health Insurance (NHI) law providing a standardized basket of medical services to all residents by the four health plans. The need for quality medical care is apparent from the core tenets of the NHI law of "justice, equality, and mutual assistance", in which "healthcare services included in the basket of medical services will be offered based on medical considerations, with reasonable quality, in a reasonable timeframe, and at a reasonable distance from the place of residence of the insured person". The Ministry of Health supervises the implementation of the law and external organizations were established for the purpose of "accompaniment and evaluation of the effect of the National Health Insurance law on health services in Israel, as well as their quality, efficiency, and expenditure" (The Health Council and The Israel National Institute for Health Policy and Health Services Research).

The model upon which the law is based is that of "managed competition" between the health plans. Since the basket of services is uniform across all four health plans and the insured do not pay direct dues to the health plan (apart from minimal copayment for the use of certain services), competition between health plans is therefore based on the quality of medical care and the nature of the services offered. Notwithstanding

the shortcomings of this market model, as well as issues related to the availability of data, there are regulatory, administrative, and financial barriers that may affect and impede the provisions for high quality medical care. Indeed, studies show that reductions in quality of medical care are a common reaction to budgetary distress.

In light of the above, the need for the assessment of the quality of medical care in Israel became clear. In March 2004, the Ministry of Health inaugurated the National Program for Quality Indicators in Community Healthcare in Israel funded by The Israel National Institute for Health Policy Research. The program developed out of a research initiative at Ben-Gurion University headed by Professor Avi Porath and Professor Gadi Rabinowitz, with the help of Dr. Anat Raskin-Segal in conjunction with Israel's four health plans [4]. The cooperation of the health plans with each other and with the program in setting quality indicators, assessing the indicators on a regular basis, and publishing them are noteworthy and are one of the cornerstones of the program's success.

The program aspires to provide the public and policymakers with information regarding the quality of healthcare services supplied by the health plans to strengthen and improve medical care offered to Israeli residents. In order to achieve this goal, the program publishes the results of a national set of quality indicators for community healthcare (herein "indicators"). This assessment enables an evaluation of the development of quality medical care over time and identification of areas that require intervention and improvement – ranging from data collection to care. In addition, the national dataset is used to compare Israel's achievements with those of other countries.

The program has set a high standard for measuring quality. Indicators are carefully chosen by a consensus of representatives from each of Israel's four health plans and are based on national and international guidelines. All processes undergo strict internal and external auditing.

Measuring the quality of care is a complex matter and a current topic of debate both in academia and in practice. Over the last decade, indicators have been developed to assess the quality of community health care in both the developed and developing world [5]. Quality indicators were implemented in the United States [6], Sweden [7], England [8], Australia [9], and the Organization for Economic Co-operation and Development (OECD) [10].

Measures included in the Israeli program relate to the quality of clinical care as drafted by professional authorities nationally and worldwide, and are rooted in similar established measures from the countries mentioned above.

Indicators were selected based on three criteria:

1. Significance – the indicators reflect the quality of treatment (preventive or active) of common illnesses, in which medical treatment has proven to be effective and contributes to decreasing morbidity.
2. Validity – the indicators reflect the quality of treatment in clinical fields in which both health status and changes in health status are properly and reliably quantifiable.
3. Feasibility – the indicators reflect the quality of treatment in fields with available and reliable data.

The set of indicators include two indicator categories:

- Prevalence (e.g. the rate of asthma patients in the general population), used as a denominator for various indicators
- Quality of medical care
  - Prevention and health promotion (e.g. breast cancer screening rates – mammography in the past two years)
  - Treatment (e.g. appropriate treatment rates for asthma patients)
  - Outcome (e.g. rates of diabetics whose HbA1c levels are lower than 7%).

All indicators, except antibiotic usage indicators, are presented as rates – the number of people in a defined group who satisfy specified criteria (e.g. the number of people who received the influenza vaccination among individuals aged 65+ years). The indicators are reported by stratification according to gender and age (determined by a team of experts), as well as socio-economic status.

In this report, two variables determined socio-economic status. The first is the same measure used in previous reports, based on entitlement to exemption from medical co-payments. The second variable is based on a pilot study which measures socio-economic status by geographical statistical area (GSA) clusters. More specific definitions of the variables, their calculation methods, and their usage is elaborated in the methods chapter.

As in former reports, the appendix of this report displays the distribution of the quality indicators by health plans, gender, age, and socio-economic status (by medical co-payment exemption entitlement). This display provides relevant information for all the

participants, including the health plans, the Ministry of Health, medical organizations, and the insured population. Of note, the report from the US Agency for Healthcare Research and Quality (AHRQ) shows that despite the initiative to publish quality indicators by the insurance providers in order to help patients choose their insurance provider, the target audience of the findings was actually the insurance providers themselves [5].

It is important to emphasize that there are several limitations for the measures we presented in this report, as elaborated in the appendix, and relate to the accuracy of the presentation of quality of treatment provided through the health plans. A pilot study has been conducted in order to overcome the main limitation of the inability to fully eliminate the influence from the varied population composition within the health plans, specifically from socio-economic status, on the indicator outcomes. In the framework of the pilot study, socio-economic status was measured based on the GSA cluster and standardization was conducted by gender, age, and this measure for socio-economic status for the data by health plan for four chosen indicators. The findings which are presented in the chapter: comparing chosen findings by membership in health plan among those aged 65 and above.

METHODS

Data Sources

The data presented in the report are based on information from patient's electronic medical records provided by Israel's four health plans. As part of their active and voluntary participation in the program, the health plans provided data for quality indicators for the years 2012–2014 that were then aggregated into the national set. Data provided by the health plans were anonymous and did not include any personal identifiers, ensuring confidentiality.

Population

The report is based on information, which originated in the computer databases of each health plan, for the insured population in the health plans. Data were missing for a small percentage of the population, about 0.7%, who are not included in this report. Additionally, members with incomplete membership in a given health plan during the study period are not included in the report. This group includes those who switched health plans within each measurement year. In 2014, approximately 137,000 people (1.7% of insured persons in 2014) switched health plans [11]. Soldiers are not included in the report demographic; however, this only affects rates for the age group 18–24 years. Aside from these exceptions, the report includes the entirety of Israel's population, approximately 7.74 million people. It is important to note that many indicators assess the quality of care provided by the general practitioner and data are therefore limited to patients with clinic visits. A recent study by Clalit Health Services has shown, however, that the majority of insured individuals visit their family doctor regularly, with over 90% of insured patients having at least one annual visit and 97% with at least one visit within a five-year period [12].

Collecting and reporting data for the entire insured population in Israel enables the assessment and monitoring of the quality of healthcare for smaller sub-groups, identified by age, gender, and socio-economic status.

Variables

For each measurement, the variables are presented for the entire relevant populations by year. The variables by health plan are presented by gender, age group, and socio-economic status. Socio-economic status is determined in this report by two variables. The first is based on exemption from co-payments when receiving health services. The health plan data indicated for 2014 that the exempt population was 11.4% of the total population. The exempt groups were determined by section 8 of the National Health Insurance (NHI) law; this group can change from time to time. In the measurement period, exemption was given by a number of criteria. Among these include allowances from the national insurance such as elderly allowance, handicap allowance, large family allowance, etc. The second variable was measured in a pilot study, which was conducted previous to this report. In this pilot study, an address list of the participants was received from the health plans by the program directorate and given to the Central Bureau of Statistics to determine the geographical statistical area (GSA) cluster of the addresses. The distribution of GSA and the calculation of the related cluster (by ranks 1-20) is completed by the Central Bureau of Statistics routinely after every population census in order to characterize each geographical unit by socio-economic status [13]. The address list was produced anonymously. The data was most recently updated on December 31, 2012 and included about 7 million records (the list includes the entire population of Israel, excluding a number of small groups i.e. soldiers and those who switched health plans). The Central Bureau of Statistics computing system automatically classified each address by socio-economic cluster. This computing system, which based its classifications on GSA, paired each record to the correct cluster. In all, 900,000 records (12%) were not paired in 2012. When an exact address from a certain community was missing from the data, the address was paired to a weighted average cluster that represented the GSA cluster of that community. This procedure was performed in 120 communities across Israel.

In 2014, the number of records without socio-economic cluster classification grew by approximately 140,000, due to new members joining the health plans in 2013. These new members include new births, new immigrants, discharged IDF soldiers, those who switched health plans, and foreign residents. It is important to note that the rate of those without a cluster decreased with age, this decrease is expected considering the types of people joining the health plans. For all the members, the socio-economic cluster in 2014 was missing for 13.5% of the insured population. The rate among insured patients aged 65 years or older was 8.5%.

Socio-economic status of the insured which was used in this report was determined by quartiles of the clusters. These quartiles were based on the distribution of all members. The quartiles were indicated by the values 1-4.

To examine the validity of the socio-economic status ranking derived from the GSA database, and the possible bias due to missing data, a comparison between the distributions of the quartiles was conducted based on the GSA clusters and the distribution of the income quartiles derived from the National Security Institute in December 2013. Personal income of the insured patients included in this data was calculated using labor income and allowances. From this comparison, a good match appeared between the distributions.

In this report, the first indicator for socio-economic status was utilized. This indicator is based on exemption status, and is found in the main findings chapter, the new indicators section, and in index I which presents the entire data by health plan. The presentation of this indicator enables comparisons with previous reports and is not associated with missing values, like the second socio-economic status indicator.

In the GSA pilot study, the data by health plan for four specifically chosen indicators was standardized by gender, age, and the second variable for socio-economic status, the GSA clusters. The chosen indicators were: the rate of colorectal cancer screening (insured patients aged 50-74 years), the rate of influenza immunization (insured patients aged 65 years or older), the rate of long-acting benzodiazepine usage (insured patients 65 years or older), and the rate of diabetes control (insured patients 18 years or older). These are important indicators, reflecting achievement in community healthcare in a variety of subjects. The presented socio-economic indicators focused on patients 65 years and older. Some of these indicators were defined by this population only and therefore the rate of missing data for this socio-economic status variable is relatively low. A confidence interval of 95% was calculated for the standardized indicators.

Report Structure

This report was written in a different format from the previous reports. This report includes the following information:

- The rate of each indicator specified for the relevant population for the years 2012-2014.

- The summary of the findings by subject, elaborating on the main findings by year, age, gender, and socio-economic status.

- A detailed report on the new indicator findings: an indicator examining the treatment of chronic asthma and an indicator examining the total usage of antibiotics. The information includes the scientific background and stratified data by year, age, gender, and socio-economic status.

- National and health plan data for the year 2014, standardized for gender, age, and socio-economic status for four chosen indicators from different subjects as stated above.

- Summary of the findings from multiple research studies that are conducted for the national program.

- An index which sections the indicators by health plan, gender, age and socio-economic status for the year 2014.

Work Plan

The preparation of this report included the following stages:

- **Indicators included in the report and indicator specifications**

This report includes most indicators presented in the 2011–2013 report [2] and a number of new indicators. However, definitions for calculating the numerator and denominator of a number of indicators were updated in order to increase the validity of the indicators and update the indicators to match the international literature.

Addition of indicators: Under the subject of respiratory diseases, a new indicator was included which examined the treatment quality of chronic asthma patients. The indicator is based on the ratio between purchase of preventative medications and the total purchased asthma medications in the measurement year. Under the new subject of antibiotic usage, two indicators were developed based on an OECD initiative and were presented for the first time. The indicators examined the scope of broad-scope antibiotic consumption among the total population that are prescribed in community healthcare, and the usage rate of broad-scope antibiotics among the total purchased antibiotics.

Updated indicators: Diabetic nephropathy indicators- the laboratory tests used to identify diabetic patients with kidney damage were updated (the laboratory test values were merged and improved). In addition, the criteria for the definition of diabetic patients who qualify for treatment with the ACE-I/ARBs family of medications was changed so that patients with an unclear indication for treatment or patients who require personalized treatment (e.g. patients with kidney damage, but without pathologic protein secretion in their urine, patients who received alternative dialysis treatment, and patients who suffer from progressive kidney failure) were excluded. For the first time, the indicator dealing with colorectal cancer screening includes members who underwent colonoscopy in the last decade (in the last report the information was limited to only nine years).

- **Indicator specification updating**

Identification of the patient population, i.e. those with a disease or disorder, is based on the purchase of medications, laboratory testing, or the billing of a procedure. (This specification is a result of issues related to data and diagnostic uniformity between health plans that rely on, among other things, the quality and availability of information passed from hospitals). A comprehensive database that includes all relevant medications and procedures is utilized and continuously updated for the relevant measurement period. In addition, some laboratory tests used to test renal function among diabetic patients were examined and now represent the general norm renal function values utilized by the kupot.

- **Data auditing**

Data from each health plan was examined at three levels: an internal data audit was conducted within each health plan, a data audit was performed by the program's directorate, and the health plans and program directorate underwent an external audit process by a certified external auditor. The objective of the audits was to ensure a high level of consistency between the health plans' data. The administrative evaluation included logic checks, subgroup analyses, and an evaluation of trends over time. The external evaluation focused on the production process and indicator construction within each health plan, as well as, processes for creating indicators for the entire population. Throughout the auditing process, methodologies, control processes, documentation, and lessons learned were examined. This approach enables continuous improvement in indicator reporting. Subjects that are emphasized in this report include: improvement of the unification between HMO's using flowcharts,

examining a variety of sources of information in each health plan (laboratories, medical record, pharmacies), and an in-depth study of medication-based measures using the classification of the Anatomical Therapeutic Chemical level 5 (ATC). Also, the directorate started using a computerized system to formulate the algorithms, which unified the definition files, enabling standardizations, and decreasing the chance for error.

- **Validation of Findings**

Health surveys, such as those from The Israel Central Bureau of Statistics, and consultations with experts are used to validate the results.

- **Creating a Database for Findings**

The written report presents information for 49 indicators in eight areas for 2012–2014. Measure outcomes were represented in 3 collections of data. 1. Distributed by years (2012-2014) 2. Four measures were presented by health plan and by standardization of gender, age, and socioeconomic status for 2014 data only 3. Data were distributed by gender, age, and exemption for 2014 data only.

Data Quality

This report is based on data from the entire population, not a representative sample. Thus the data presented here are not susceptible to sampling error. However, other sources of error are possible [14]. The method created for data collection includes an extensive evaluation program intended to minimize the chance of various errors, including differences between health plans in documentation and coding of their insured population's characteristics, and is based on recommendations noted in the US Agency for Healthcare Research and Quality report entitled, *Methodological Considerations in Generating Provider Performance Scores for Use in Public Reporting* [5]. This method has certainly led to fewer errors, but is unable to eliminate them entirely. Therefore, small changes in data among a given group (age or gender) over various years should be considered with caution.

Main Findings by Topic (2012-2014)

In preparation for the report, quality measures in various areas of community healthcare were examined methodologically. The added data in this report regarding economic performances and patient satisfaction levels provides the directorate with a wide understanding and allows them to make wise decisions in this important area of

the health system. The report was edited in a slightly different structure than the previous reports, as elaborated in the methods chapter.

The 2012-2014 report indicates continuous increased trends in some of the measures and stability of the others. Those tendencies are outcomes of focused work by the health plans in community healthcare.

It is worth noting there was a continual increase in screening for colorectal cancer. In addition, there were improvements in influenza vaccinations rates among elderly and chronically ill patients, as well as, an increase in smoking documentation rate. In addition, there was an improvement in long-term benzodiazepine usage among elderly and in spirometry testing among COPD patients.

Nevertheless, despite the fact that most of the measures exhibited continuous improvement among the total population, still in several measures there are differences between exempt patients/patients who received a discounted co-payment, a weak socioeconomic population, and the others. Several measures did not improve in the last year, for example the rate of pneumococcal vaccination among elderly patients.

This report includes several new measures and reflects updates that have been conducted in several measures to improve their validity and comparability to the international literature. The main changes follow: in the respiratory measures, a new measure examines the quality of treatment among chronic asthma patients. This measure is based on the ratio between the number of preventative medications purchased and the total asthma medications that were purchased in the measure year. In addition, two measures were included for the first time in this report regarding broad-spectrum antibiotic use in the Israeli population. Those measures were developed through an OECD initiative.

Health and Wellness

Health Promotion

Obesity

- In the measurement years (2012-2014), the scope of the documentation of the BMI components among adults (aged 20-74) increased from 86% in 2012 to 88% in 2013 and remained stable in 2014. In 2014, the documentation rate was higher for women compared to men (90% vs. 87%), young adults (20-64) compared to elderly (65-74) (88% vs. 81%), and exempt patients compared to the general populations (90% vs. 87%).

- In 2014, the prevalence of obesity (BMI≥30) among those aged 20-74 was 24%. The rate remained stable through the measurement years. The rate was higher in women compared to men (26% vs. 22%). Among the exempt patients, the obesity prevalence was 1.7 times higher compared to the rest of the population.

Smoking

- The rate of smoking documentation among individuals aged 16–74 years was 88% in 2014. The rate showed improvement throughout the measurement years (absolute difference of about 8%). In 2014, the documentation rate was 4% higher among women compared to men (91% vs. 87%) and in exempt patients compared to the rest of the population (94% vs. 88%).

- The smoking rate among patients aged 16-74 was 20% in 2014. The rate slightly decreased throughout the measurement period (absolute difference about 1%). In 2014, the smoking rate among men was 2 times higher than women (28% vs. 13%). The smoking rate among exempt patients was higher by approximately 2% than the rest of the population (22% vs. 20%).

Cancer Screening

Breast cancer screening – mammography

- Throughout the measurement years, there were slight improvements in mammography performance. The rate in 2013 reached 70% and remained stable in 2014. The performance rate was lower among exempt women as compared to non-exempt women. The absolute difference between these groups was 2% in 2014 (68% vs. 70%), a smaller difference compared to 2013.

Colorectal cancer screening

- Throughout the measurement years, there were continual improvements in colorectal cancer screening (absolute difference of 4%) and the rate in 2014 reached 59%. In 2014, the performance rate among women was higher as compared to men by about 3% (60% vs. 57%). The screening rates were similar among exempt patients and the rest of the population.

Child and Adolescent Health

Anemia screening for infants

- During the measurement period, there was a slight improvement in the rate of anemia screening (hemoglobin testing) and in 2014 the rate reached 86%. The screening performance rate was similar among males and females and infants from exempt families versus the rest of the population.

Height and weight documentation for children

- The height and weight documentation rate among children aged 7 years old slightly increased throughout the measurement period. In 2014, the rate was 74% as compared to 72% in 2012. During the measurement years, the documentation rate was similar among males and females. Among patients from exempt families, the rate of documentation was higher by about 4% than the rest of the population (78% vs. 74%, 2014).

- During the measurement years, there was a slight but continuous change in the documentation rate of BMI components among adolescents aged 14-18. In 2014, the rate was 75% compared to 69% in 2012. Documentation rates were similar for boys and girls. Higher rates of documentation were observed among children belonging to the exempt compared with the general population (78% vs. 74%, 2014).

Older Adults 65+ years

Influenza vaccination

- In 2014, influenza vaccination rates among adults aged 65+ years was 63%, an absolute increase of 3% compared to 2012. Influenza vaccination rates were higher among men compared to women by 5% and increased with age, but were similar between the exempt population and the general population.

Pneumococcal vaccination

- In 2014, the pneumococcal vaccination rate was 76%, about 1% less than the former year. During the measurement period, men were vaccinated at a rate 3% higher than women (78% vs. 75%, 2014) and the exempt population was vaccinated at a rate 3% higher than the general population.

Body Weight Documentation

- In 2014, the documentation rate among elderly aged 65 years and older was 81% and remained stable during the measurement period. The rate was similar between genders, but was higher among the exempt population compared to the rest (83% vs. 80%). In addition, the highest documentation rate was seen among those aged 70-79 (83%). Among those aged 85 and older the documentation was 70%.

Benzodiazepine Usage

- The rate of benzodiazepine overuse among those 65 years and older was 5%, and remained stable during the measurement period. The rate increased with age and reached 11% among those aged 85 years and older in 2014. During the measurement period, the rate was 1.6 times higher among women compared to men and among the exempt population compared to the general population.
- The rate of long-acting benzodiazepine usage among those aged 65 years and older decreased by 1% during the measurement period and reached 2.6% in 2014. The rate increased with age and remained at 3% among those aged 75 and older. The usage rate was 1.4 times higher among women compared to men, but was similar between the exempt and non-exempt populations.

Chronic Diseases

Respiratory Diseases

Asthma

- Rates of persistent asthma remained stable throughout the measurement period. The prevalence of this disease was 0.83% among individuals aged 5–44 years. The 20-24 year age group suffered the least from this disease, with a higher prevalence among men (0.94%) versus women (0.71%). This difference decreased as age increased. As in former years, in 2014, a significant gap was found in asthma prevalence between the exempt population and the general population (rate of persistent asthma was 2.1 times higher among the exempt population).

- In 2014, the prevalence rate of asthma among populations with an Asthma Medication Ratio (AMR) > 0.5 among those aged 5-44 was 68% and increased during the measurement period from 66% in 2012. The rate was similar between genders, but lower among the exempt population (62%) as compared to the rest of the population (69%).

- The rate of influenza vaccination among chronic asthma patients was 42% and increased during the measurement period from 37% in 2012. The rate decreased significantly with age, but increased after age 30. The rate was 2% higher among women compared to men and significantly higher among the exempt population than the general population (absolute difference of 15%).

Chronic Obstructive Pulmonary Disease (COPD)

- The rate of diagnostic spirometry among those recently diagnosed with COPD or at a high-risk for COPD aged 50-74 was 56%. During the measurement period, the rate significantly increased from 42% in 2012. The rate increased with age and was higher among men than women (58% vs. 54%). The rate was similar between the exempt and non-exempt population.

Cardiovascular Health

Cholesterol Levels

- During the measurement years, the rate of cholesterol checks was stable and remained at 87% among those aged 35-54 years and at 77% among those 55-74 years. Women were checked at a higher rate than men (86% vs. 80%) and the

exempt population was checked at a higher rate than the general population (86% vs. 82%).

- The target LDL cholesterol level was achieved among 83% of the population aged 35-74 years throughout the measurement period. In 2014, rate of achieving the target LDL cholesterol level was higher among women (86%) than men (79%). There was no difference in rate between the exempt population and the non-exempt population. About 70% of the population were defined as "low-risk" for heart disease and among those 89% achieved the target LDL cholesterol level, about 1% less than 2012. About 28% of the population were classified as "intermediate risk", among those the rate of achieving the target LDL cholesterol level was stable compared to the former years at 72%. Only 2% of the population were classified as "high-risk" for heart disease and among those, as in former years, only 28% achieved the target LDL cholesterol level.

Blood Pressure Documentation

- During the measurement period, the documentation rate remained stable at 89% among those aged 20-74. In 2014, the rate was 92% among those aged 20-54 and 82% among those aged 55-74. The rate was higher among women (91%) than men (87%), but similar between the exempt and non-exempt population.

Tertiary Prevention of Heart Disease

- Among patients aged 35 years and above who underwent cardiac bypass and/or cardiac catheterization, 82% purchased medications to decrease cholesterol in 2014. The rate decreased by 1% every year in the measurement period. Women purchased less medications than men (79% vs. 83%). The treatment rate increased with age from 48% among those aged 35-39 to 87% among those aged 70-74 and 76% among those aged 85 years or older. The rate among the exempt population was slightly higher compared to the general population (83% vs. 81%).

- During the measurement period, the rate of patients aged 35 years or above who underwent cardiac bypass and/or cardiac catheterization and achieved the target LDL cholesterol level (LDL cholesterol < 100 mg/dL) was stable and remained at 73%. In 2014, the rate of men who achieved the target LDL cholesterol level was higher than women by 10% (75% vs. 65%). The rate of patients who reached the target LDL cholesterol level increased with age from 59% among those aged 35-39 up to 79% among those aged 70-74, with a slight decrease to 69% among those aged 85 years and older. The rate of patients who achieved the target LDL

cholesterol level was 90% among the exempt population compared to 87% among the general population.

Diabetes

Adults 18 years and older

- During the measurement period, there was 0.1% increase of diabetes prevalence each year among those aged 18 years or older, so that by 2014 the prevalence of diabetes was 9.7%. The rate of diabetes among men was higher compared to women (10.3% vs. 9.2%). The rate among the exempt population was 3.6 times higher as compared to the general population (25.5% vs. 7.1%). The prevalence rate increased with age, so that among those aged 40-44 that rate was 3.2% and reached its maximum value of 33.3% among those aged 75-79.

Quality of Treatment among Diabetics

- The rate of diabetics whose HbA1c was checked at least once a year remained stable at a high level during the measurement period. The 2014 rate was 90% and was slightly higher among women compared to men, and among the exempt population compared to the general population (91% vs. 89%, in both cases).

- The rate of controlled diabetes among diabetics aged 18-84 (HbA1c ≤ 7% or 8%, depending on age and length of disease) increased by 4% during the measurement period, and was 67% in 2014. The rate of diabetics reaching the target HbA1c level increased with age, among those aged 40-44 the rate was 49% compared to 85% among those aged 80-84. The rate was 5% higher in women compared to men, but was similar among the exempt population and the non-exempt population.

- The rate of non-controlled diabetes among diabetics aged 18 and older (HbA1c ≥ 9%) was 12% in 2014, and remained steady throughout the measurement period. The rate decreased with age, was similar between genders, but slightly higher among the exempt population as compared to the general population (13% vs. 11%).

Monitoring complications for patients with diabetes mellitus
diabetic retinopathy

- The rate of eye examination among diabetics aged 18-84 was 75% in 2014. The rate was slightly higher among women than men (77% vs 74%) and among the exempt population as compared to the general population (76% vs. 74%).

Diabetic nephropathy

- The rate of urinary protein tests among diabetics aged 18-84 was 79% in 2014 and increased during the measurement period. The rate increased with age from 66% among those aged 18-24 up to 83% among those aged 70-74. The rate was similar between genders, as well as, between the exempt and non-exempt population.
- The documentation rate of glomerular filtration rate (GFR) among diabetics aged 18-84 was 91% throughout the measurement period. In 2014, the rate increased with age from 81% among those aged 20-24 to 95% among those aged 80-84. The rate was slightly lower among men compared to women (90% vs. 93%) and higher among the exempt population compared to the general population (94% vs. 90%).
- The rate of diabetics aged 18-84 suffering from diabetic nephropathy was stable at 31% throughout the measurement period. In 2014, the rate increased significantly with age from 9% among those aged 20-24 to 53% among those aged 80-84. The rate among men was slightly higher compared to women (32% vs. 29%) and 1.4 times higher in the exempt population compared to the general population (38% vs. 26%).
- Among diabetic nephropathy patients, 76% purchased ACEI/ARB medications in 2014. The rate decreased slightly during the measurement period by 1% each year. ACEI/ARB purchasing was slightly higher among men than women (77% vs. 75%) and among the exempt population compared to the general population (79% vs. 74%).

Monitoring and controlling diabetic co-morbidities

- The blood pressure documentation rate among diabetic patients aged 18 and above was 91% in 2014 and the target blood pressure rate (blood pressure ≤ 140/90 mmHg) was achieved among 84% of the diabetic patients. These rates remained stable during the measurement period and were similar between genders and exempt versus non-exempt populations.
- The rate of LDL cholesterol tests in diabetic patients aged 18 years and older remained stable during the measurement period and reached 91% in 2014. The rate was slightly higher among women compared to men, and among the exempt population versus the non-exempt population (92% vs. 89% in both comparisons).

- The rate of diabetic patients aged 18 years or older who reached the target LDL cholesterol level (LDL cholesterol ≤ 100 mg/dL) remained stable during the measurement period and was 63% in 2014. The rate of diabetics who reached the target LDL cholesterol level was 7% higher among men than women, and 3% higher in the exempt population than the rest.

- The rate of BMI documentation among diabetic patients aged 18 years or older remained stable throughout the measurement period and reached 88% in 2014. The rate was similar among both genders and 2% higher among the exempt population.

Vaccinations

- The rate of influenza vaccination among diabetic patients aged 18 years or older increased throughout the measurement period, from 58% in 2012 to 62% in 2014. The vaccination rate increased with age, from 45% among aged 30-34 years to 70% among aged 85 years and older. The rate was higher in men (63%) than women (61%), and among the exempt population (66%) versus the general population (60%).

- The rate of pneumococcal vaccination among older patients with diabetes mellitus (65–74 years) was 84% in 2014 and remained stable throughout the measurement period. The rate was slightly higher among men (85%) than women (82%), and among the exempt population (85%) than the general population (83%).

Children and Adolescents (aged 2-17)

- The prevalence rate of diabetes among children and adolescents (aged 2-17 years) was 0.12% in 2014 and increased 0.01% compared to 2012 and 2013. The rate increased with age and was similar between genders. However, a substantial difference was seen between socioeconomic statuses, as measured by patients whose parents were exempt from medical co-payments. Those from the exempt population had a diabetes prevalence 10 times higher than the general population.

Quality of treatment among diabetics

- In 2014, 88% of diabetic children and adolescents had a least one visit to a pediatric diabetic clinic and this rate increased 1% each year during the measurement period. The rate was similar between genders and slightly higher among the exempt population as compared to the general population (89% vs. 86%).

- The rate of diabetic children and adolescents who underwent HbA1c testing at least once a year was 75% in 2014 and increased 1% each year during the measurement period. The rate increased with age, from 69% among aged 5-9 to 79% among aged 15-17.
- The rate of uncontrolled diabetes among children and adolescents (HbA1c > 9%) was 37% in 2014 and decreased during the measurement period (43% in 2012). The rate was similar between genders, but significantly higher among the exempt population as compared to the general population (41% vs. 30%).
- The rate of influenza vaccination among diabetic children and adolescents was 50% in 2014 and increased during the measurement period (45% in 2012). The rate was similar between genders, but significantly higher among the exempt population as compared to the general population (54% vs. 45%).

Antibiotic Usage Rate

The total antibiotic usage was measured as per 1000 persons per day.

- The rate was stable during the measurement period and was about 21 DDD/1000 persons/day. The rate was lower among men than women (18 vs. 24 DDD/1000 persons/day). The rate was 1.8 times higher among the exempt population compared to the general population (34 vs. 19 DDD/1000 persons/day).

Cephalosporin and quinolone usage rate

- The rate cephalosporin and quinolone usage was 24% from the total antibiotic usage and remained stable during the measurement period. The rate was lower among men versus women (21% vs. 26%), and 1.3 times higher among the exempt population as compared to the general population (31% vs. 23%).

Main findings compared to international outcomes for four indicators

1. Rate of colorectal cancer screening

In 2014, the national rate of fecal occult blood screening in the last year or a colonoscopy in the last decade among those aged 65-74 in Israel was 66.5%. There was an absolute increase of 7.3% since 2011. The national rate was higher than the reported rates in other countries. For example, the average rate in the OECD countries in 2010 for colorectal cancer screening (fecal occult blood screening once every two years) among those aged 50-74 was 12.7% [15]. The highest rate was in Germany (54.2%). The rate of fecal occult blood test once per year or flexible sigmoidoscopy once every five years or colonoscopy once every ten years in the United States among Medicare (a federal insurance program) insured patients aged 65-75 years in 2011 was 60.0% [6].

2. Rate of influenza vaccination

In 2014, the national rate of influenza vaccination among those aged 65 years and older in Israel was 63.4% with an absolute increase of 4.7% since 2011. In 2013 [16], the average rate of influenza vaccination in 33 OECD countries was 48%, while the Israeli rate was 61.2%. Israel ranked in the highest quartile of the influenza vaccination rate, while Britain, the United States, and Canada achieved higher rates (75.5%, 66.5%, and 64.1%, respectively), and the European countries of Germany, France, and Sweden presented lower rates (58.6%, 51.9%, and 45.8%, respectively).

3. Rate of long-acting benzodiazepine usage

From 2011 to 2014, there was an absolute decrease of 1.2% in the national rate of long-acting benzodiazepine usage. In 2013, the rate of long-acting benzodiazepine usage in Israel was 3.1% and only Finland and Sweden reported lower rates (2.3% and 2.7%, respectively). Canada and Germany reported slightly higher rates (4.5% and 3.3%, respectively) and in Luxembourg, Norway, Spain, and Slovakia the rates were significantly higher (10.3%, 8.8%, 10.3%, and 16.8%, respectively) [17].

4. Rate of controlled HbA1c levels among diabetics

In 2014, the rate of controlled diabetes among those aged 65-84 was 76.7% in Israel. There was an absolute increase of 7.1% of the national rate since 2011. Most of the diabetic patients in 2014 checked their HbA1c (89.7%), so that determining the rate of

controlled of diabetes was possible. The rate of controlled HbA1c among diabetics was higher in Israel than other countries. For example, in the United States in 2012 this rate among Medicare insured diabetic patients aged 65-75 was 64.3% [18]. In 2011, the rate of diabetics in Sweden with HbA1c less than 6.9% was 50% and the rate of those with HbA1c less than 7.9% was 78% [7].

Results

Quality Indicators in Community Healthcare 2012-2014, Rates

	Measure	2012	2013	2014
	Health Promotion			
	Documentation of Body Mass Index (BMI) components for adults (ages 20-74 years)	**85.6%**	**87.7%**	**87.5%**
	Prevalence of obesity for adults (ages 20-74 years)	**24.4%**	**24.1%**	**24.1%**
	Smoking status documentation (ages 16-74 years)	**79.7%**	**83.9%**	**88.3%**
	Rate of smoking (ages 16-74 years)	**20.7%**	**20.2%**	**20.1%**
	Cancer screening			
	Breast cancer screening – mammography (women, ages 51-74 years)	**68.4%**	**69.9%**	**69.7%**
	Colorectal cancer screening (ages 50-74 years)	**55.2%**	**57.3%**	**58.9%**
	Child and adolescent health			
	Rate of hemoglobin testing for infants	**84.3%**	**84.8%**	**85.6%**
	Documentation of height and weight for children (age 7 years)	**72.2%**	**73.0%**	**74.1%**
	Documentation of Body Mass Index (BMI) components for adolescents (ages 14-18 years)	**69.3%**	**72.7%**	**75.2%**
	Elderly adults			
	Rate of influenza vaccination for older adults (ages 65+ years)	**60.2%**	**62.4%**	**63.4%**
	Rate of pneumococcal vaccination for older adults (ages 65-74 years)	**77.4%**	**77.2%**	**76.3%**
	Documentation of body weight for older adults (ages 65+ years)	**79.7%**	**81.8%**	**80.5%**
	Rate of benzodiazepine overuse for older adults (ages 65+ years)	**5.3%**	**5.2%**	**5.3%**
	Rate of long-acting use of benzodiazepines for older adults (ages 65+ years)	**3.6%**	**3.1%**	**2.6%**
	Respiratory Diseases			

	Prevalence of persistent asthma (ages 5-44 years)	0.89%	0.89%	0.83%
	Asthma medication ratio (AMR) greater than or equal to 0.5 (ages 5-44 years)	65.9%	66.2%	67.9%
	Use of appropriate asthma control medication for individuals with persistent asthma (ages 5-44 years)	79.5%	80.0%	79.5%
	Rate of influenza vaccination for individuals with persistent asthma (ages 5-44 years)	36.5%	37.3%	41.6%
	Rate of diagnostic spirometry testing in patients with COPD or those at high-risk for COPD (ages 50-74 years)	41.8%	50.3%	56.1%
	Cardiovascular health			
	Rate of cholesterol level testing (ages 35-54 years)	86.5%	87.1%	87.3%
	Rate of cholesterol level testing (ages 55-74 years)	77.4%	78.0%	76.7%
	Rate of achieving target LDL cholesterol in those at high-risk for heart disease (ages 35-74 years)	84.0%	83.6%	83.3%
	Rate of LDL cholesterol level less than or equal to 160 mg/dL in those at low-risk for heart disease (ages 35-74 years)	90.4%	90.1%	89.4%
	Rate of LDL cholesterol level less than or equal to 130 mg/dL in those at medium-risk for heart disease (ages 35-74 years)	72.4%	71.8%	71.7%
	Rate of LDL cholesterol level less than or equal to 100 mg/dL in those at high-risk for heart disease (ages 35-74 years)	28.4%	27.7%	28.1%
	Documentation of blood pressure (ages 20-54 years)	91.1%	92.1%	92.1%
	Documentation of blood pressure (ages 55-74 years)	80.6%	82.8%	81.9%
	Rate of use of LDL-lowering drug therapy post-cardiac bypass surgery and/or cardiac catheterization (ages 35+ years)	84.2%	82.9%	82.1%
	Rate of LDL cholesterol level less than or equal to 100 mg/dL post-cardiac bypass surgery and/or cardiac catheterization (ages 35+ years)	73.2%	72.9%	72.5%
	Diabetes			
	Prevalence of diabetes mellitus (ages 18+ years)	9.53%	9.58%	9.71%
	Documentation rate of hemoglobin A1c (HbA1c) levels for individuals with diabetes mellitus (ages 18+ years)	89.0%	89.6%	89.7%
	Assessment of adequate control of hemoglobin A1c for individuals with diabetes mellitus (ages 18-84 years)	63.2%	64.3%	66.5%
	Rate of HbA1c greater than 9% for individuals with diabetes mellitus (ages 18+ years)	12.4%	12.2%	11.6%
	Documentation rate of eye exams for individuals with diabetes mellitus (ages 18+ years)	76.6%	74.2%	75.1%
	Documentation rate of urinary protein for individuals with diabetes mellitus (ages 18-84 years)	76.3%	77.8%	79.0%

	Documentation of glomerular filtration rate (GFR) in individuals with diabetes mellitus (ages 18-84 years)	**90.7%**	**91.3%**	**91.3%**
	Rate of diabetic nephropathy in individuals with diabetes mellitus (ages 18-84 years)	**29.9%**	**30.1%**	**30.5%**
	Rate of treatment with ACEI/ARB for diabetic nephropathy in individuals with diabetes mellitus (ages 18-74 years)	**77.9%**	**76.8%**	**76.3%**
	Documentation rate of blood pressure for individuals with diabetes mellitus (ages 18+ years)	**89.6%**	**91.1%**	**90.6%**
	Rate of blood pressure less than or equal to 140/90 mmHg in individuals with diabetes mellitus (ages 18+ years)	**83.4%**	**83.7%**	**83.7%**
	Documentation rate of cholesterol in individuals with diabetes mellitus (ages 18+ years)	**90.3%**	**90.8%**	**90.5%**
	Rate of LDL cholesterol less than or equal to 100 mg/dL in individuals with diabetes mellitus (ages 18+ years)	**63.8%**	**63.8%**	**63.2%**
	Documentation rate of Body Mass Index (BMI) components in individuals with diabetes mellitus (ages 18+ years)	**86.6%**	**88.0%**	**87.7%**
	Rate of influenza vaccination in individuals with diabetes mellitus (ages 18+ years)	**57.5%**	**61.2%**	**62.2%**
	Rate of pneumococcal vaccination in individuals with diabetes mellitus (ages 65-74 years)	**83.9%**	**84.3%**	**83.5%**
	Prevalence of diabetes mellitus (ages 2-17 years)	**0.11%**	**0.11%**	**0.12%**
	Rate of diabetes clinic visits in children with diabetes mellitus (ages 2-17 years)	**86.1%**	**86.5%**	**87.5%**
	Documentation rate of hemoglobin A1c levels for children with diabetes mellitus (ages 2-17 years)	**73.0%**	**74.5%**	**75.4%**
	Rate of HbA1c greater than 9% for children with diabetes mellitus (ages 2-17 years)	**43.1%**	**38.2%**	**36.7%**
	Rate of influenza vaccination in children with diabetes mellitus (ages 2-17 years)	**45.1%**	**48.3%**	**50.3%**
	Antibiotic Treatment			
	Rate of total antibiotic use per 1000 persons per day	**21.2**	**21.1**	**20.7**
	Rate of cephalosporin and quinolone antibiotic use, of total antibiotic drugs	**24.2%**	**24.0%**	**24.2%**

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