*International Journal for Quality in Health Care* 2011; **Volume 23, Number 1:** pp. 15–25
Advance Access Publication: 16 November 2010
10.1093/intqhc/mzq065

# Adherence to standards of care by health maintenance organizations in Israel and the USA

BRUCE ROSEN[1], AVI PORATH[2], L. GREGORY PAWLSON[3], MARK R. CHASSIN[4] AND JOCHANAN BENBASSAT[1]

[1]Smokler Center for Health Policy Research, Myers-JDC-Brookdale Institute, Jerusalem, Israel, [2]Department of Health Policy and Management, Ben-Gurion University of the Negev, Beersheva, Israel, [3]National Committee for Quality Assurance, Washington DC, USA, and [4]Joint Commission, Chicago, IL, USA

Address reprint requests to: Bruce Rosen, Smokler Center for Health Policy Research, Myers-JDC Brookdale Institute, PO Box 3886, Jerusalem 91037, Israel. Tel: +972-26-55-74-60; Fax: +972-25-61-23-91; E-mail: bruce@jdc.org.il

Accepted for publication 7 October 2010

## Abstract

**Background.** The health-care systems in the USA and Israel differ in organization, financing and expenditure levels. However, managed care organizations play an important role in both countries, and a comparison of the performance of their community-based health plans could inform policymakers about ways to improve the quality of care.

**Objectives.** To compare the adherence to standards of care in Israel and in the USA.

**Study design.** An observational study comparing trends in performance using data from reports of the National Quality Measures Program in Israel and of the National Committee for Quality Assurance in the USA.

**Results.** Differences in specifications preclude a comparison between most measures in the two reports. However, the comparison of 11 similar measures in the 2007 reports indicates that performance was higher in the USA by 10 or more percentage points on four measures (flu immunization, medication for asthma, screening for colorectal cancer and monitoring for diabetic nephropathy). Performance was higher in Israel on three measures in patients with diabetes (blood pressure, low-density lipoprotein (LDL) cholesterol and glycemic control), and similar on the remaining four measures. Between 2005 and 2007, quality of care improved in both countries. However, improvement was slower in the USA than in Israel.

**Conclusions.** In comparison with the USA, Israel achieves comparable health maintenance organization (HMO) quality on several primary care indicators and more rapid quality improvement, despite its substantially lower level of expenditure. Considering the differences between the two countries in settings and populations, further research is needed to assess the causes, generalizability and policy implications of these findings.

**Keywords:** quality measurement, quality management, quality improvement, quality management, quality indicators, measurement of quality, primary care/general practice, setting of care

## Introduction

The USA and Israel are among the few countries where managed care organizations (MCOs) play an important role in the health system. However, the two countries differ with regard to how they finance their health care, the market share of MCOs and the nature of the quality assurance programs. These similarities and differences may make a comparison of the quality performance in the two countries useful for policymakers, despite the difficulties inherent in any such comparison. A comparison of the performance of MCOs in the two countries could lay the basis for cross-national learning with a view to improving quality and managing care more effectively in both countries.

The objective of this paper is to compare (i) performance on similar measures related to clinical practice in Israel and in the USA, (ii) performance in each country by socioeconomic status (SES) and (iii) the changes in performance in each country over time. The term 'performance', as used here, refers to the adherence rates to various standards of practice that are used to measure the quality of health care.


© The Author 2010. Published by Oxford University Press in association with the International Society for Quality in Health Care; all rights reserved


Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

## Background

Israel provides universal health insurance coverage that is financed through income-linked taxation. Israelis can choose between the nation's four competing non-profit health plans, all of which provide a package of benefits that is prescribed by law. The government funds the health plans through capitation payments, which reflect the number of members in each plan and their age mix. Almost 90% of the primary care physicians (PCPs) work for only one health plan. About 60% of the PCPs work on a salaried basis; the other 40% work as independent physicians under contract to one or more health plans. In 2007, Israel spent about $1700 per person on health care, accounting for 7.7% of GDP. Life expectancy was 82.4 years for women and 78.7 years for men, and infant mortality was 3.9 per thousand births. In 2007, Israel had 3.7 physicians up to age 65 (the retirement age in 2007), 2.0 acute care beds and 173 acute care discharges per thousand population [1].

In the USA, most employed adults have health insurance through their employers. The federal government provides health insurance for the elderly (Medicare), current and some prior veterans (Department of Defense and Veteran's Affairs) and some low-income persons through a joint federal-state program (Medicaid). About 15% of the population is uninsured. Of the population insured through employers, about one-third are enrolled in health maintenance organizations (HMOs) or point-of-service (POS) plans, almost two-thirds are enrolled primarily in preferred provider organizations (PPOs), with a small proportion in consumer-driven health plans or traditional fee-for-service plans. Only a small proportion of PCPs works for only one health plan. A proportion of patients covered under Medicare (15%) and Medicaid (50%) are also enrolled in managed care plans (HMO and PPO). Most HMOs in the USA do not directly deliver care, and instead contract with independent hospitals and physicians. In 2007, the USA spent approximately $7400 per person on health care, accounting for 16.2% of GDP. Life expectancy was 80.4 years for women and 75.3 years for men; the infant mortality rate was 6.4 per thousand births. In 2006, the USA had 2.6 physicians, 3.0 beds in non-federal short-stay hospitals and 117 discharges per thousand population [2].

Table 1 summarizes the key differences between the USA and Israeli health systems.

**Table 1** Summary of key differences between US and Israeli health care

| | Israel | USA |
|---|---|---|
| Main sources of finance for basic insurance | Government | Employers and government |
| Percent insured | 100 | 85 |
| Percent HMO | 100 | 25–35 |
| Percent of PCPs working for one plan | 90 | <20 |
| Main forms of PCP reimbursement | Salary and capitation | Fee-for-service |
| Per capita spending on health | $1700 | $7400 |
| Infant mortality rate (per thousand births) | 3.9 | 6.4 |

*Sources*: refs [1, 2, 21].

## Methods

We retrieved the National Committee for Quality Assurance (NCQA) reports [3] related to the quality of care in the USA, and the National Quality Measures Program (NQMP) reports [4] of the Israeli quality measures program. The NCQA report includes data on the clinical performance at the plan level for nearly all HMOs and many PPOs; however, we used only the HMO-specific data to increase the comparability with the Israeli HMO data and because to date fewer than half of US PPOs report quality data to NCQA.

In 2007, the NQMP reported aggregate data on 37 measures of adherence to standards of care in Israel, and the NCQA reported data on 39 such measures in the USA. However, the Israeli monitoring system provided a more detailed scrutiny of the management of patients with diabetes mellitus and cardiovascular diseases than the US system. On the other hand, many other content areas of the NCQA monitoring system were not included in the Israeli report. After identifying the subset of measures for which comparable data were available for the two countries, we carried out three types of comparison. First, we compared the performance data on measures in the 2007 Israeli and USA reports. The Israeli reports present global national data, while the NCQA reports separately on the quality of care by US commercial plans working in the private sector, Medicaid and Medicare. We obtained from the NCQA weighted averages of the data from these three sources, and compared these averages with the global Israeli data.

Second, we compared the performance by patients' estimated SES. In Israel, the NQMP reports separately on the quality of care of patients who are exempted from co-payments for certain health services (elderly receiving income support, persons receiving disability allowances and families with four or more children), and the quality of care of the remaining population. As noted previously, NCQA provides data on the quality of care by US commercial plans, Medicaid and Medicare. The Medicaid population has substantially lower incomes than that of the population in commercial plans [5], and therefore, comparisons between commercial plans and Medicaid reflect to some degree SES differences. Medicare covers the elderly, and therefore, comparisons between commercial plans and Medicare plans in part reflect age differences.

Finally, we compared the changes in performance between 2005 and 2007 in Israel and the USA. Since the US HEDIS program was initiated 4 years before the Israeli NQMP



Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

program, we also compared the changes in performance rates between 2005 and 2007 in Israel with those between 2001 and 2003 (i.e. after a similar duration of time since the initiation of the program) in the USA.

We defined adherence rates to standards of care as dissimilar if they differed by 10 or more percentage points. We did not feel the use of statistical tests was necessary, because the size of the data sets ensured that this level of differences would be highly significant.

## Results

### Adherence to standards of care in Israel and the USA in 2007

Differences in specifications precluded a direct comparison between most measures of adherence to standards of care in the two reports. However, 11 of the measures in Israel and the USA were roughly comparable (Table 2). These measures pertained to five areas: flu immunizations, mammography, early detection of colorectal cancer, and management of bronchial asthma and diabetes mellitus. Although similar, none of the specifications of the measures listed in Table 2 is identical. The Israeli report defines patients with diabetes mellitus and bronchial asthma as those who had purchased specific medications on two or more occasions in the past. The US data rely on both diagnoses reported on claims, as well as medication use to define the denominators. Adherence to standards in flu immunization was determined in populations aged >65 years of age in Israel, and >50 years in the USA. Performance of mammography was restricted to the last 2 years in Israel, but not in the USA, and more importantly, to women of different ages. Finally, the criteria for screening for colorectal cancer included occult fecal blood and colonoscopy in Israel, and occult fecal blood, colonoscopy and barium enema in the USA and over different time periods.

While we recognize that differences in specifications are limiting factors, these 11 measures are roughly similar and comparable. The comparison of the reports in the two countries indicated that the weighted performance in the USA was higher than in Israel by 10 or more percentage points on four measures: flu immunization, medication for asthma, screening for colorectal cancer and monitoring nephropathy in patients with diabetes mellitus. In patients with diabetes, performance was higher in Israel than in the USA on three measures: blood pressure (BP), low-density lipoprotein (LDL) cholesterol and glycemic control, and it was roughly the same on the remaining three measures in diabetic patients and on adherence rates to mammography.

We obtained similar results when we reduced the required differences in adherence rates to 5 percentage points. Performance was higher in the USA than in Israel by

**Table 2** Adherence to standards of practice in Israel and the USA in 2007 on 11 roughly similar measures of quality assurance

| Measure of performance as defined in the Israeli report | Israel, all health plans | Measure of performance as defined in the US report | Adjusted aggregate average |
|---|---|---|---|
| Flu immunization during last winter (percent of those >65 years) | 55.9 | Flu immunization during last flu season (percent of those >50 years) | 65.8 |
| Mammography in last 2 years (percent of those 52–74 years) | 60.6 | Mammogram to screen for breast cancer during an unspecified period of time (percent of those aged 40–69 years) | 67.8 |
| Occult fecal blood in last year (percent of those 50–74 years) | 22.1 | Either of the following: occult fecal blood in last year, sigmoidoscopy in last 4 years, double contrast barium enema in last 4 years, colonoscopy in last 9 years (percent of those 50–80 years) | 54.0 |
| Colonoscopy in last 5 years (percent of those 50–74 years) | 16.2 | | |
| Purchase of three or more prescriptions for long-term control of bronchial asthma, during last year, percent of patients aged 5–56 years | 78.0 | Prescribed medication for long-term control of bronchial asthma (percent of patients with bronchial asthma aged 5–56 years) | 90.3 |
| Treatment of diabetes mellitus | | | |
| A1c Hb in last year, recorded (%) | 91.7 | A1c Hb recorded (%) | 87.1 |
| A1c Hb >9% | 13.3 | A1c Hb > 9% | 31 |
| Referral to ophthalmologist (%) | 62.8 | Referral to ophthalmologist (%) | 56.8 |
| Blood lipids in last year, recorded (%) | 91 | Blood lipids recorded (%) | 83.2 |
| LDL cholesterol <100 | 60.6 | LDL cholesterol <100 | 43.5 |
| Urinary microglobulin in last year, recorded (%) | 70.8 | Monitoring nephropathy (%) | 81.5 |
| BP <130 mmHg systolic | 66.8 | BP <130 mmHg systolic | 31.7 |

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

≥5% points on five measures (flu immunization, mammography, medication for asthma, screening for colorectal cancer and monitoring for nephropathy in diabetics), while it was higher in Israel than in the USA on six measures of diabetes mellitus care (BP control, LDL cholesterol monitoring and control, glycemic monitoring and control and referral to ophthalmologist).

### Adherence to standards of care in Israel and the USA in 2007 by SES

When compared with other Israeli patients, those who are exempted from co-payments had *equal or higher* rates (by >10 percent points) on 35 of the 37 measures, including those with diabetes mellitus, as already reported previously [6] (Appendix 1).

In the USA, adherence rates were equal or higher in Medicaid/Medicare patients than in commercial insurance enrollees on 19 of the 39 measures. Commercial insurance/Medicare enrollees had higher rates than Medicaid enrollees on 13 of the 39 measures, and there were no comparative data on the remaining 7 measures (Appendix 2).

### Changes in adherence to standards of care over time

Between 2005 and 2007, adherence to standards of care increased by ≥10 percentage points on 13 of the 37 measures in Israel (Appendix 3). In the USA such an increase was observed on only 3 of the 39 measures between 2005 and 2007, and on only 1 of the 18 measures with available data between 2001 and 2003 (Appendix 4). A different pattern emerged when 'increase' in performance was defined as one of ≥5 percentage points. Between 2005 and 2007 adherence to standards of care increased by this magnitude on 21 of the 37 measures in Israel, but only on 5 of the 39 measures in the USA. However, between 2001 and 2003, adherence to standards of care increased in the USA on 9 of the 18 measures with available data.

In other words, the increase in performance between the fifth and the seventh year after the initiation of the quality measurement programs appeared to be larger in Israel than in the USA when a 10 percentage point cutoff was used and similar in the two countries when a 5 percentage point cutoff was used.

Similar findings were obtained when attention was restricted to the 11 relatively comparable measures listed in Table 2.

## Discussion

### Possible reasons for differences in adherence to standards

We have already referred to the differences in specifications and standards of practice as limiting factors in the comparison between the 11 roughly similar measures. It should be also noted that these 11 standards do not reflect the quality of health care in general, but are rather limited to primary and secondary prevention. Still, these measures are widely used in both countries, and they suggest generally comparable quality of care in several key dimensions of primary care in the USA and in Israel.

The achievement of comparable quality of care in several key dimensions of primary care at much lower health expenditure by the Israeli health-care system is probably due in part to lower costs of key inputs, such as physicians' salaries, and possibly to more efficient management of care and pervasive use of advanced electronic health records systems [7]. Electronic health records permit both reminders and effective feedback. The higher proportion of PCPs in Israel who are employed by a single health plan, may facilitate cooperation between health plans and physicians on quality improvement. It may also be that Israeli HMOs dedicate a larger portion of resources to primary care, so that the gap between the two countries in per capita spending on primary care may be smaller than the 3-fold difference for health care as a whole. Finally, as most US HMOs do not directly deliver care (and instead work largely through various types of physician organization), they probably face more barriers and limitations in implementing quality improvement initiatives than do Israeli plans. This latter possibility is supported by evidence that the level of performance on clinical quality measures is higher in HMOs in the USA that are more tightly linked to physician practices [8].

Several specific factors may have also contributed to the differences in performance between the two countries. The differences in prevention of colorectal cancer could be cultural. Large segments of the Israeli population are reluctant to perform tests of their feces, particularly when asymptomatic. Some of the differences may be due to accessibility: in Israel, unlike the USA, colonoscopy is not included in the benefit package as a screening examination and, accordingly, was addressed in the Israeli indicator set in the last report only. Adherence to flu immunization and mammography may have been biased against the USA by the wider age span of the target population, as younger and older enrollees are less likely to adhere to immunization and mammography. The differences in the definitions of bronchial asthma and diabetes mellitus may have resulted in the USA system capturing patients with less severe disorders. Finally, it has been our impression that Israeli HMOs have focused their quality improvement efforts on diabetic care and mammography with less attention to asthma and cancer care.

### Possible reasons for differences in extent of disparity

By most indicators, the Israeli health-care system appears to be more egalitarian than that in the USA. The lower performance on quality indicators for patients in lower sociodemographic states in the USA has already been noted by others [9] and is one of the foci of the annual National Health Care Disparities Report prepared by AHRQ for the Congress. Possible explanations for the smaller disparities in



Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

Israel include first, the socio-economic and cultural differences between Israelis who are exempted from co-payments and American Medicaid recipients. Second, differences in type of coverage: in Israel, all low-income persons are covered by mainstream health plans and cared for by the same hospitals and physicians as others, while in the USA, about a third of them are covered by separate health plans [10] and many are cared for by hospitals and physician practices that are almost exclusively safety net providers with very limited resources. Third, in Israel, once the indicator system highlighted differences among population groups, some of the health plans made specific interventions aimed at reducing the gaps Finally, as low-income persons in Israel are exempted from the $5 co-payment for visits to specialists, they may actually have greater access to specialist care than middle-income persons, a factor that would be relevant for those dimensions of performance where specialists play a role.

## Possible explanations for changes over time

In both countries, there was a general trend to improvement on most measures of quality. In part, this trend may be attributable to competition, even though two recent studies have questioned its impact on HMOs' quality measures in the USA [11, 12]. The mere provision of feedback may also trigger some quality improvement. In some cases, the improvement may be due to various strategies, such as educational interventions [13], encouragement of practicing physicians to adhere to evidence-based standards of care [14] and financial incentives for achieving specified performance targets [15]. Finally, the improvement may have also been due to some degree to the influx into the physicians' workforce of medical graduates who are more familiar with evidence-based clinical guidelines, and whose attitudes to quality assurance are more positive than those of older physicians.

Between 2005 and 2007, improvement of quality of care was slower in the USA than in Israel. The slowdown in the quality improvement of US health care after a decade of improvement has been also noted by others, and was particularly striking in 2008 [16]. The similarity of the degree of improvement by $\geq$5 percentage points between Israel in 2005–07, and the USA in 2001–03 suggests that the differences in improvement between the two countries may be attributable to Israel being at an earlier stage of the learning curve. However, at both periods of time, the improvement by $\geq$10 percentage points was slower in the USA than in Israel. Therefore, it is also possible that the slower improvement in the USA is due to the constantly changing population of patients enrolled in HMOs. It may also be that the larger involvement of Israeli HMOs in care management is enabling them to extend the period over which improvement is possible.

## Study limitations

The presented findings have three main limitations. First, the comparison between the US and Israeli programs may be biased by the differences in the specifications of the quality measures. This limitation is not unique to our study. It featured also in the comparisons of quality across the OECD countries [17–19]. The plethora of differences in measure specifications is surprising, since the Israeli NQMP drew heavily on the HEDIS system for its measurement set. We need more information on the process whereby the measures of the Israeli system were derived and why they ended up deviating from the HEDIS measures.

Second, our findings represent a comparison between the quality of care provided by US and Israeli HMOs in the community (outpatient) setting, rather than between the global care in the two countries. Systems for monitoring quality of care in hospitals are much more developed in the USA than in Israel, and international comparisons suggest that while the USA lags behind other industrialized countries on various aspects of preventive and chronic care, it is a leader in cancer care and some other dimensions of acute hospital care [20]. Our study does not include either of these. It focuses on community-based services, which are considered to be an area of relative strength within the Israeli health delivery system.

Third, the available data cover HMO enrollees in both countries (100% in Israel and 90% in the USA). However, a rigorous comparison of quality of care for the entire population of the USA was not possible, since there is essentially no quality data on the roughly three-fifths of the population that are enrolled in traditional Medicare, much of Medicaid, PPOs and the 15% that is uninsured.

Only about 20% of PPOs report quality data to the NCQA, and their results tend to be slightly lower than those of the HMOs. Since PPOs that do report quality data may focus more on quality, it is likely that their performance is superior to that of the remaining PPOs. Similarly, uninsured US citizens have lower access to care than the insured population, and it is likely that the care they receive performs less well on the quality measures considered in this paper. Hence, performance on the HEDIS measures for the overall US population is likely to be lower than the average reported for the US HMOs that are the subject of the present study.

## Directions for further research

Detection of variations in practice provides an opportunity for its improvement. Therefore, we believe that an effort should be made to understand why the USA and Israel perform differently in some measurement areas, what they can learn from each other and what factors are most important in the apparent ability of Israel to provide a similar level of quality at a substantially lower cost. Second, future studies should explore the response of managed care institutions to reports of quality assurance of health care in an attempt to answer the question: 'What actions have been initiated in order to improve the quality of health care and how do these action affect outcomes, resource use and cost?'

Finally, an effort should be made to facilitate and expand the comparability between the systems for monitoring health care across nations. To this end, we need to define internationally agreed measures of quality of care for specific

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

disease measurement areas and target populations. We suggest establishing an international conceptual framework, similar to the OECD project for monitoring the quality of health care [17, 18], which would guide the selection of specific standards of performance.

## Acknowledgements

The authors gratefully acknowledge the help of the following experts who were involved in the development of the health-care monitoring systems in the USA and in Israel: Alik Aviram (Israel National Institute of Health Policy), Arnon Cohen (Clalit Health Services), Eran Metz (Leumit Health Services), Stephen Schoenbaum (Commonwealth Fund), Mordechai Shani (Tel-Hashomer) and Cary Sennett (ABIM). Helpful comments were also received from Karen Feinstein (Jewish Healthcare Foundation), Nurit Friedman (Maccabi), Keith Kanel (Pittsburgh Regional Health Initiative), Laura Rosen (Tel Aviv University), Barbara Silverman (Maccabi) and Hava Tabenkin (Clalit Health Services).

**Appendix 1** Adherence to standards of practice in Israel (2007) by SES. Low SES patients defined as those exempted from co-payment for services

| Measure of performance | Exempted (low SES) | Not exempted |
|---|---|---|
| Immunization during last winter (percent of those >65 years) | | |
| Flu | 49.5 | 59.9 |
| Pneumococcus | 33.9 | 38.7 |
| Mammography in last 2 years (percent of those 52–74 years) | 56.6 | 62.1 |
| Early detection of colorectal cancer | | |
| Occult fecal blood in last year (percent of those 50–74 years) | 23 | 21.8 |
| Colonoscopy in last 5 years (percent of those 50–74 years) | 15.4 | 16.4 |
| Screening of children | | |
| Hb examinations in babies, recorded (percent of those 9–18 months) | 67.7 | 66.3 |
| Body mass index (BMI) in children, recorded (percent of those 14–18 years) | 29.6 | 26.9 |
| Bronchial asthma | | |
| Purchase of three or more prescriptions for medications for long-term control of bronchial asthma, during last year (percent of patients aged 5–56 years) | 69.1 | 79.5 |
| Flu immunization of asthmatic patients | 42.1 | 26.3 |
| Primary prevention of cardiovascular disorders | | |
| Age 35–54 years | | |
| Blood cholesterol in last 5 years recorded (%) | 85.3 | 77.5 |
| LDL cholesterol <130 mg (%) | 68.2 | 66.9 |
| Weight recorded in last 5 years (%) | 51.6 | 39.5 |
| Height recorded in last 5 years (%) | 48.8 | 36.2 |
| BMI recorded in last 5 years (%) | 57.1 | 39.7 |
| BP recorded in last 5 years (%) | 76.4 | 70.2 |
| BP <140 mmHg (%) | 94.8 | 95.7 |
| Age, 54–74 years | | |
| Blood cholesterol in last year, recorded (%) | 80 | 74.6 |
| LDL cholesterol <130 mg (%) | 73.6 | 71.2 |
| Weight recorded in last year (%) | 59.1 | 52.9 |
| Height recorded in last year (%) | 69.8 | 64.8 |
| BMI recorded in last year (%) | 58.7 | 60.4 |
| BP recorded in last year (%) | 82.5 | 74.6 |
| BP <140 mmHg (%) | 84.5 | 86.4 |
| Secondary prevention of cardiovascular disorders | | |
| Patients after bypass surgery | | |
| Statins | 81.9 | 83.8 |
| ACEI/ARB | 66.8 | 57.6 |
| Beta blockers | 72.3 | 68.5 |
| LDL cholesterol <100 | 64.8 | 69.9 |

(*continued*)

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

**Appendix 1** Continued

| Measure of performance | Exempted (low SES) | Not exempted |
|---|---|---|
| Patients after angioplasty | | |
| Statins | 84.2 | 84.5 |
| ACEI/ARB | 69.6 | 60.6 |
| Beta blockers | 71.1 | 66.2 |
| LDL cholesterol <100 | 66.9 | 70.4 |
| Diabetes mellitus | | |
| A1c Hb in last year, recorded (%) | 92.3 | 91.3 |
| A1cHb <7% | 48 | 50.3 |
| A1cHb >9% | 14.3 | 12.7 |
| Of all patients with A1cHb >9%, percent treated with insulin | 52.4 | 39.1 |
| Referral to ophthalmologist (%) | 64.5 | 61.8 |
| Blood lipids in last year, recorded (%) | 91.7 | 90.5 |
| LDL cholesterol <100 | 59.9 | 61 |
| Urinary microglobulin in last year, recorded (%) | 70.5 | 70.9 |
| BMI in last year, recorded (%) | 73.5 | 72.6 |
| BP in last year, recorded (%) | 91.2 | 88.3 |
| BP <130 mmHg systolic | 66.7 | 66.9 |
| Flu immunization, (percent diabetic patients) | 52 | 48.5 |
| Pneumococcal immunization (percent diabetic patients) | 28.2 | 22.9 |

ACEI/ARB, angiotensin converting enzyme inhibitor and angiotensin receptor blocker.

**Appendix 2** Adherence to standards of care in the USA (2007) by type of insurer

| Measure of performance | USA, Medicaid | USA, Medicare | USA, commercial insurance |
|---|---|---|---|
| Immunization during last flu season (percent of those >50 years) | – | 68.6 | 48.6 |
| Mammography during an unspecified period (percent of those 40–69 years) | 49.9 | 67.3 | 69.1 |
| Early detection of colorectal cancer | | | |
| Either of the following: occult fecal blood in last year, sigmoidoscopy in last 4 years, double contrast barium enema in last 4 years, colonoscopy in last 9 years (percent of those 50–80 years) | – | 50.4 | 55.6 |
| Bronchial asthma | | | |
| Prescribed medication for long-term control, during last year, percent of patients aged 5–56 years | 86.9 | – | 92.3 |
| Hypertension | | | |
| Patients age 18–85 years | 53.4 | 57.7 | 62.2 |
| BP during past year <140 mmHg (%) | | | |
| Advising smokers to quit | 69.5 | 75.4 | 75.8 |
| Patients after myocardial infarction | | | |
| Beta blockers | 62 | 75.5 | 71.9 |
| Any cardiovascular condition | | | |
| LDL screening rates | 76.3 | 87.9 | 88.2 |
| LDL cholesterol <100 | 38.3 | 55.9 | 58.7 |
| Diabetes mellitus | | | |

(*continued*)

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

**Appendix 2** Continued

| Measure of performance | USA, Medicaid | USA, Medicare | USA, commercial insurance |
|---|---|---|---|
| A1c Hb ever recorded (%) | 77.3 | 88.1 | 88.1 |
| A1cHb <7% | – | – | – |
| A1cHb >9% | 47.9 | 29 | 29.4 |
| Referral to ophthalmologist (%) | 49.9 | 62.7 | 55.1 |
| Blood lipids recorded (%) | 70.8 | 85.7 | 83.9 |
| LDL cholesterol <100 | 31.3 | 46.8 | 43.8 |
| Monitoring nephropathy (%) | 74.4 | 85.7 | 80.6 |
| BP <130 mmHg systolic | 29.5 | 31.7 | 32.1 |
| Treatment and screening of children | | | |
| Testing for children with pharyngitis | 59.0 | No data | 74.7 |
| Treatment for children with respiratory infection | 84.0 | No data | 83.5 |
| Childhood immunization status | 72.2 | No data | 80.8 |
| Care of children with ADHD | 38.9 | No data | 38.7 |
| Screening for lead poisoning in children | 61.4 | No data | No data |
| Prenatal and postnatal care. | 81.4 | No data | 92.0 |
| Treatment of adults and elderly patients | | | |
| Urinary incontinence | No data | 35.4 | No data |
| Medication in the elderly | No data | 23.2 | No data |
| Osteoporosis testing and management | No data | 20.4 | No data |
| Fall risk management | No data | 55.8 | No data |
| Physical activity in older adults | No data | 53.0 | No data |
| Monitoring of patients on persistent medication | 80.1 | 84.3 | 76.6 |
| Advice for smoking cessation | 69.5 | 75.4 | 75.8 |
| Screening for | | | |
| Cervical cancer | 64.7 | No data | 81.7 |
| Chlamydia screening in women | 54.2 | No data | 39.2 |
| Glaucoma screening | No data | 59.6 | No data |
| Treatment of mental disorders | | | |
| Follow-up after hospitalization for mental illness | 61.0 | 54.4 | 74.0 |
| Antidepressant medication | 27.4 | 48.7 | 46.1 |
| Treatment of drug and alcohol dependence | 14.4 | 4.5 | 15.2 |
| Appropriate management of specific disorders: | | | |
| Acute bronchitis (avoiding antibiotics) | 25.9 | No data | 25.4 |
| Rheumatoid arthritis | 68.2 | 68.7 | 85.3 |
| Low back pain (avoiding imaging studies) | 77.3 | No data | 74.6 |
| Use of spirometry to assess COPD | 28.4 | 27.2 | 35.4 |

**Appendix 3** Adherence to standards of care in Israel in 2005 and 2007

| Measure of performance | 2005 | 2007 |
|---|---|---|
| Immunization during last winter (percent of those >65 years) | | |
| Flu | 51 | 56 |
| Pneumococcus | 26 | 37 |
| Mammography in last 2 years (percent of those 52–74 years) | 56 | 61 |
| Early detection of colorectal cancer | | |
| Occult fecal blood in last year (percent of those 50–74 years) | 9 | 22 |
| Colonoscopy in last 5 years (percent of those 50–74 years) | 12 | 16 |

(*continued*)

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

**Appendix 3** Continued

| Measure of performance | 2005 | 2007 |
|---|---|---|
| Screening of children | | |
| Hb examinations in babies, recorded (percent of those 9–18 months) | 59 | 66 |
| BMI in children, recorded (percent of those 14–18 years) | 11 | 27 |
| Bronchial asthma | | |
| Purchase of three or more prescriptions for medications for long-term control of bronchial asthma, during last year (percent of patients aged 5–56 years) | 75 | 78 |
| Flu immunization of asthmatic patients | 31 | 28 |
| Primary prevention of cardiovascular disorders | | |
| Age, 35–54 years | | |
| Blood cholesterol in last 5 year recorded (%) | 72 | 78 |
| LDL cholesterol <130 mg (%) | 63 | 67 |
| Weight recorded in last 5 years (%) | 15 | 40 |
| Height recorded in last 5 years (%) | 13 | 37 |
| BMI recorded in last 5 years (%) | 15 | 41 |
| BP recorded in last 5 years (%) | 50 | 71 |
| BP <140 mmHg (%) | 94 | 96 |
| Age, 54–74 years | | |
| Blood cholesterol in last year, recorded (%) | 69 | 76 |
| LDL cholesterol <130 mg (%) | 65 | 72 |
| Weight recorded in last year (%) | 20 | 55 |
| Height recorded in last year (%) | 28 | 66 |
| BMI recorded in last year (%) | 21 | 60 |
| BP recorded in last year (%) | 62 | 77 |
| BP <140 mmHg (%) | 82 | 86 |
| Secondary prevention of cardiovascular disorder patients after bypass surgery | | |
| Statins | 79 | 83 |
| ACEI/ARB | 58 | 62 |
| Beta blockers | 69 | 70 |
| LDL cholesterol <100 | 56 | 68 |
| Medication after angioplasty (%) | | |
| Statins | 81 | 84 |
| ACEI/ARB | 60 | 64 |
| Beta blockers | 69 | 68 |
| LDL cholesterol <100 | 58 | 69 |
| Diabetes mellitus | | |
| A1c Hb in last year, recorded (%) | 88 | 92 |
| A1cHb <7% | 43 | 49 |
| A1cHb >9% | 16 | 13 |
| Of all patients with A1cHb > 9%, percent treated with insulin | 40 | 45 |
| Referral to ophthalmologist (%) | 59 | 63 |
| Blood lipids in last year, recorded (%) | 87 | 91 |
| LDL cholesterol <100 | 48 | 61 |
| Urinary microglobulin in last year, recorded (%) | 58 | 71 |
| BMI in last year, recorded (%) | 39 | 73 |
| BP in last year, recorded (%) | 77 | 89 |
| BP <130 mmHg systolic | 61 | 67 |
| Flu immunization (percent diabetic patients) | 47 | 50 |
| Pneumococcal immunization (percent diabetic patients) | 18 | 25 |

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

**Appendix 4** Changes in adherence to standards of care in the USA 2001–03 and 2005–07 (%)

| Measure of performance | 2001 | 2003 | 2005 | 2007 |
|---|---|---|---|---|
| Immunization during last flu season (percent of those >50 years) | – | 48–74 | 36–70 | 49–69 |
| Mammography during an unspecified period (percent of those 40–69 years) | 55–76 | 56–75 | 54–72 | 50–69 |
| Early detection of colorectal cancer | | | | |
| Either of the following: occult fecal blood in last year, sigmoidoscopy in last 4 years, double contrast barium enema in last 4 years, colonoscopy in last 9 years (percent of those 50–80 years) | | 47–50 | 52–54 | 50–56 |
| Bronchial asthma | | | | |
| Prescribed medication for long-term control, during last year, percent of patients aged 5–56 years | 60–66 | 64–71 | 86–90 | 87–92 |
| Hypertension | | | | |
| Patients age 18–85 years | | | | |
| BP during past year <140 mmHg (%) | 53–55 | 59–62 | 61–69 | 53–62 |
| Advising smokers to quit | 61 | 63–69 | 66–76 | 70–76 |
| Patients after myocardial infarction | | | | |
| Beta-blockers | 88–93 | 84–94 | 65–70 | 62–76 |
| Any cardiovascular condition | | | | |
| LDL screening rates | 51–77 | 58–81 | 62–82[a] | 76–88 |
| LDL cholesterol <100 | 35–59 | 39–67 | 29–54[a] | 38–59 |
| Diabetes mellitus | | | | |
| A1c Hb ever recorded (%) | 72–86 | 75–88 | 76–89 | 77–88 |
| A1cHb <7% | – | – | – | – |
| A1cHb >9% | 27–48 | 23–49 | 24–49 | 29–48 |
| Referral to ophthalmologist (%) | 46–66 | 45–65 | 49–67 | 50–63 |
| Blood lipids recorded (%) | 67–86 | 76–91 | 81–93 | 71–86 |
| LDL cholesterol <100 | – | 28–42 | 33–50 | 31–47 |
| Monitoring nephropathy (%) | 42–52 | 44–54 | 49–60 | 74–86 |
| BP <130 mmHg systolic | | | 30[b] | 30–32 |
| Treatment and screening of children | | | | |
| Testing for children with pharyngitis | – | 54, 71 | 82, 70 | 59, 75 |
| Treatment for children with respiratory infection | – | 80, 81 | 83, 83 | 84, 84 |
| Childhood immunization status | 59, 68 | 62, 74 | 70, 78 | 72, 81 |
| Care of children with ADHD | – | – | – | 39, 39 |
| Screening for lead poisoning in children | – | – | – | 61 |
| Prenatal care | 73, 85 | 77, 89 | 79, 92 | 81, 92 |
| Treatment of adults and elderly patients | | | | |
| Urinary incontinence | – | – | 35 | 35 |
| Medication in the elderly | – | – | 24 | 23 |
| Osteoporosis management | – | 18 | 20 | 20 |
| Fall risk management | – | – | 56 | 56 |
| Physical activity in older adults | – | – | 46 | 47 |
| Monitoring of patients on persistent medication | – | – | – | 80, 84, 77 |
| Advice for smoking cessation | 61 | 66, 63, 69 | 66, 76, 71 | 70, 75, 76 |
| Screening for | | | | |
| Cervical cancer | 61, 80 | 64, 82 | 65, 82 | 65, 82 |
| Chlamydia screening in women, age 21–25 | 41 | 46 | 52, 35 | 54, 39 |
| Glaucoma screening | – | – | 62 | 60 |

(*continued*)

Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011

**Appendix 4** Continued

| Measure of performance | 2001 | 2003 | 2005 | 2007 |
|---|---|---|---|---|
| Treatment of mental disorders | | | | |
| 30 day follow-up after hospitalization for mental illness | 52, 60, 73 | 56, 60, 74 | 57, 59, 76 | 61, 54, 74 |
| Antidepressant medication, chronic | 30, 37, 45 | 29, 29, 44 | 30, 41, 45 | 27, 49, 46 |
| Treatment of drug and alcohol dependence | – | – | 10, 5, 14 | 14, 5, 15 |
| Appropriate management of specific disorders: | | | | |
| Acute bronchitis (avoiding antibiotics) | – | – | 31, 34 | 26, 25 |
| Rheumatoid arthritis | – | – | 68, 64, 81 | 68, 69, 85 |
| Low back pain (avoiding imaging studies) | – | – | 79, 75 | 77, 75 |
| Use of spirometry to assess COPD | – | – | 27, 26, 35 | 28, 27, 36 |

[a]Data available for 2004 only.
[b]Data available for 2006 only.

## References


1. Rosen B, Samuel H. Israel: health system review. *Health Syst Transit* 2009;**11**:1–226.
2. National Center for Health Statistics 2009. Health United States. Department of Health and Human Services, 2008.
3. State of Health Care Quality. National committee for quality assurance. Washington DC. www.ncqa.org (June 2009, date last accessed).
4. National Quality Measures Program. State of Israel and National Institute for Health Policy. www.israelhpr.org.il (June 2009, date last accessed).
5. Medicaid program—general information. http://www.cms.hhs.gov/MedicaidGenInfo/03_TechnicalSummary.asp# (June 2009, date last accessed).
6. Jotkowitz AB, Rabinowitz G, Raskin A *et al*. Do patients with diabetes and low socioeconomic status receive less care and have worse outcomes? A national study. *Am J Med* 2006;**119**:665–9.
7. Gilutz H, Novack L, Shvartzman P *et al*. Computerized community cholesterol control (4C): meeting the challenge of secondary prevention. *Isr Med Ass J* 2009;**11**:23–9.
8. Gillies RR, Chenok KE, Shortell SM *et al*. The impact of health plan delivery system organization on clinical quality and patient satisfaction. *Health Serv Res* 2006;**41**:1181–99.
9. Zaslavsky AM, Hochheimer JN, Schneider EC *et al*. Impact of sociodemographic case mix on the HEDIS measures of health plan quality. *Med Care* 2000;**38**:981–92.
10. Kaiser Family Foundation. Medicaid and managed care. http://www.kff.org/medicaid/upload/Medicaid-and-Managed-Care-Fact-Sheet.pdf.
11. Scanlon DP, Swaminathan S, Chernew M *et al*. Competition and health plan performance: evidence from health maintenance organization insurance markets. *Med Care* 2005;**43**:338–46.
12. Scanlon DP, Swaminathan S, Lee W *et al*. Does competition improve health care quality? *Health Serv Res* 2008;**43**:1931–51.
13. Lu CY, Ross-Degnan D, Soumerai SB *et al*. Interventions designed to improve the quality and efficiency of medication use in managed care: a critical review of the literature. *BMC Health Serv Res* 2008;**8**:75.
14. Curry SJ. Organizational interventions to encourage guideline implementation. *Chest* 2000;**118**(2 Suppl.):40S–46S.
15. Doran T, Fullwood C. Pay for performance: is it the best way to improve control of hypertension? *Curr Hypertens Rep* 2007;**9**:360–7.
16. NCQA Press Release. http://www.ncqa.org/tabid/1077/Default.aspx (22 October 2009, date last accessed).
17. Kelley ET, Arispe I, Holmes J. Beyond the initial indicators: lessons from the OECD Health Care Quality Indicators Project and the US National Healthcare Quality Report. *Int J Qual Health Care* 2006;**18**(Suppl. 1):45–51.
18. Arah OA, Westert GP, Hurst J *et al*. A conceptual framework for the OECD Health Care Quality Indicator Project. *Int J Qual Health Care* 2006;**18**(Suppl. 1):5–13.
19. Mattke S, Kelley E, Scherer P *et al*. and the HCQI expert group members. Health care quality indicators project—initial indicators report. OECD Health Working Papers. http://www.oecd.org/health/hcqi (July 2009, date last accessed).
20. Docteur E, Berenson RA. How does the quality of U.S. health care compare internationally? http://www.rwjf.org/files/research/qualityquickstrikeaug2009.pdf (September 2009, date last accessed).
21. Rosen B, Kanel K. *Health Care in the U.S. and Israel: A Comparative Overview*. Myers-JDC-Brookdale Institute and The Jewish Healthcare Foundation, 2010.


Downloaded from intqhc.oxfordjournals.org at Hebrew University of Jerusalem on August 2, 2011