

A Scoping Review of US Insurers' Use of Patient-Reported Outcomes

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Demonstrating the value of health care is a central goal of the US health care system.^{1,2} As financiers of health care, health insurance providers have a vested interest in value, as market competition demands that they show value to current and potential purchasers of their products. There are many definitions of value within a health care context, including, but not limited to, member satisfaction, quality, member outcomes, access to services, total cost, and out-of-pocket member costs.³

One important definition of value in health care is health-related quality of life (HRQOL)—that is, an individual's subjective assessment of their emotional, physical, and social functioning.⁴ Standardized measures of HRQOL have a long history in research, with more recent use in clinical practice, and are an important component of achieving patient-centered care.^{5,6} These measures are conceptually part of a broader set of patient-reported outcomes (PROs) that also encompass measures of satisfaction, engagement with care, and health care experiences, also known as patient-reported experience measures (PREMs).⁷ Here we focus on standardized PRO measures (PROMs) of HRQOL that could support health insurance payers in many aspects of their missions, such as monitoring population health, evaluating internal and external programs, monitoring the quality of different insurance products, identifying high-risk individuals, and determining benefit coverage.

Multiple-item questionnaires can be categorized by their breadth; disease-specific questionnaires focus on the symptoms, sequelae, and treatment effects of a disease such as migraine, whereas generic questionnaires give an overall holistic view of HRQOL.⁸ Multiple-item questionnaires can also be categorized by their construction; psychometric measures, such as the Short Form-36 (SF-36), measure the amount of a construct, whereas econometric measures, such as the EuroQol 5-dimension instrument, measure the value of a construct.

Outside the United States, standardized HRQOL measures have been used in value-based purchasing, such as cost per quality-adjusted life-year thresholds used in coverage decision-making.⁹ Inside the United States, PROMs are increasing in prominence as a way to measure the quality and value of care, as evidenced by

ABSTRACT

OBJECTIVES: To complete a scoping review of US health insurers' use of health-related quality of life (HRQOL) patient-reported outcome measures (PROMs).

STUDY DESIGN: Literature review.

METHODS: A literature search was constructed for articles that contained an insurer-related term and an HRQOL-related term between 1999 and 2019 using the MEDLINE, Embase, Web of Science, Cochrane Database of Systematic Reviews, EconLit, and Business Source Complete databases.

RESULTS: The search identified 14,253 unduplicated records, of which 2340 passed abstract screening and 350 were included in the review. The populations addressed in these studies included both populations with specific health conditions (eg, diabetes) and an entire member population. The most common purpose of the article was to evaluate a policy or program (n = 255; 72.9%); the range of interventions evaluated included federal policy, subgroup management strategies, and identification of individual patients. The most common insurance mechanism was Medicare (n = 205; 58.6%). The most common source of data was collected specifically for a research project (n = 172; 49.1%), and the least common source of data was collected by providers at the point of care (n = 34; 9.7%). The most commonly addressed age group was 65 years and older (n = 262; 74.9%), and the least commonly addressed was younger than 18 years (n = 36; 10.3%). The most commonly used PROMs were single-item self-rated health (n = 138; 47.1%) and activities of daily living (n = 88; 30.0%), with validated depression questionnaires (n = 56; 19.1%) being the most common disease-focused questionnaire.

CONCLUSIONS: This review found a wide variety of articles across insurance providers, health conditions, and uses of PROMs. There is a noted paucity of data in pediatric populations and little information about the use of data collected within health care settings that is transmitted to health insurers.

Am J Manag Care. 2022;28(6):e232-e238. doi:10.37765/ajmc.2022.89162

increased inclusion in the National Quality Forum metrics¹⁰ and as a requirement of bundled payment agreements with CMS.¹¹ Likewise, US value-based purchasing initiatives are emerging, such as the Institute for Clinical and Economic Review's collaboration with CVS Health Corporation to determine pharmacy benefit plans and the American Society of Clinical Oncology's value framework.¹²⁻¹⁴

To the best of our knowledge, there is not a comprehensive review of the extent, range, or characteristics of HRQOL PROMs used by US health payers to put these newer initiatives in context. Here, we provide a scoping review of the literature to address this knowledge gap.

METHODS

We followed the methodology outlined by Arksey and O'Malley,¹⁵ followed PRISMA-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) guidelines,¹⁶ and registered the protocol on Open Science Framework before beginning analyses.¹⁷ Authors held conference calls every 2 weeks and utilized ad hoc email communication.

Identification of Articles

A professional health science librarian (R.T.) prepared the search strategy, and the review was managed within the DistillerSR (Evidence Partners) online systematic review software. The search terms required an insurer-related term (eg, health insurance, health plan, payer) and an HRQOL-related term (eg, patient-reported outcome, self-rated health, Patient Health Questionnaire-9). We searched MEDLINE (via PubMed), Embase (Embase.com), Web of Science (Clarivate), the Cochrane Database of Systematic Reviews (Wiley), EconLit, and Business Source Complete (EBSCO). The search was run on September 24, 2019, and was limited to studies published after 1999. The full search strategy is in the [eAppendix Table](#) (available at [ajmc.com](#)).

Level 1: Abstract Screening

All abstracts were screened for scope. Excluded abstracts were those that were exclusively outside the United States, did not study a health insurance member population, or used only PROs related to PREMs or wearables. If these characteristics could not be assessed from the abstract, it was included in level 2. Each abstract was screened by 2 of the authors who reviewed articles (J.H., A.M.C., B.G.G., P.M., E.C.S.S., and S.M.K.), and any discrepancies were discussed until consensus was reached.

Level 2: Full-Article Screening

All articles were screened to verify that the article focused on a health insurance member population within the United States. Articles

TAKEAWAY POINTS

The 350 articles identified in this review covered a broad set of health conditions and purposes for which US health insurers use patient-reported outcomes (PROs) about health-related quality of life. More than half the articles addressed Medicare populations. The most common PRO was a single question about self-rated health across all studies and within all insurance subgroups except the Department of Veterans Affairs. Sixty articles used nonvalidated PROs. PROs were used as an analytic outcome 41% of the time. There were few articles about PRO use in pediatric populations or about the use of PRO data collected at the point of care. This review:

- ▶ Provides a catalog of documented uses of PROs about health-related quality of life by US health insurers over the past 20 years.
- ▶ Provides context for future initiatives, such as value-based purchasing with PROs.
- ▶ Identifies gaps in the current literature that should be addressed in future research.

were included if (1) the study participants were sampled in part or in whole because they were a member of an insurance product (eg, Medicare members) or members of more than 1 insurance product (eg, patients who were either Medicare or Department of Veterans Affairs [VA] members); (2) the unit of analysis was health care providers who provide care within a managed care or health maintenance organization entity (ie, being a provider for a managed care entity was part of the inclusion criteria); or (3) the source was a commentary, white paper, or opinion that specifically discusses health insurers' use of HRQOL PROs.

We then screened in studies about an insurer's management of its population while screening out studies in which the health insurance member population provided an accessible frame for descriptive or epidemiologic studies (eg, studies that used Surveillance, Epidemiology, and End Results–Medicare to evaluate associations in populations with cancer).¹⁸ Included articles focused on population health management, such as the application of data, care models, and financing strategies to improve the health and utilization of an entire group of patients/members. Studies were included if there was clear indication that insurers could use results to inform quality of care, preventive care, or care/disease management or coordination activities; to reduce or control health care utilization and/or costs; to evaluate the effect of an insurance activity such as providing a specific intervention or a financing model or trying to influence when or how members get care; or to measure/monitor member health status. We included only articles for management of physical and behavioral health; we excluded those articles that solely focused on other aspects of insurance, such as dental, supplemental or “gap,” or long-term supports and services insurance.

Private health insurer data are typically proprietary; therefore, any study that is done using a single private insurer's data is almost certainly for the use of the insurer, in some way. Determining whether Medicare or Medicaid “used” PROs for population health management was more challenging than for private health insurers. Public CMS data set access is widespread and use in research is common, so a study that focused on Medicare participants could not automatically be assumed to meet our inclusion criteria unless language was very explicit (eg, “researchers from CMS conducted

this study..."). For government insurance products, we included a publication if it either (1) evaluated an existing or future CMS- or government-directed population strategy, initiative, or intervention (eg, bundled payments, benefit expansion, modifications of quality measures, demonstration projects, value-based insurance design) or (2) would directly inform identification and targeting of strategies, initiatives, or interventions to specific populations.

An HRQOL PRO had to be in the article to be included.

For study protocol articles or ClinicalTrials.gov sources, we performed a secondary search to determine whether there were published results. If so, we excluded the protocol sources. We also performed secondary searches when an article was excluded but clearly referenced a parent study or paper that met inclusion criteria. All articles were screened by 2 of the 3 team members (J.H., E.C.S.S., and S.M.K.) most experienced with insurance products, and any discrepancies were discussed until consensus was reached.

Level 3: Article Abstraction

We abstracted (1) type of research article (quantitative, qualitative, mixed-methods, protocol, white paper, commentary or editorial, review article or meta-analysis, or other); (2) years of data; (3) use of a comparison group; (4) sample size; (5) whether the insurer was part of an integrated delivery and financial system; (6) type of insurance plan (employer-sponsored, commercial, Medicare fee-for-service, Medicare Advantage, Medicaid, Children's Health Insurance Plan [CHIP], Medicare Special Needs Plan, VA, or other); (7) a free-text description of the study population; (8) ages in the study population (0-17, 18-64, and/or ≥ 65 years); (9) study outcomes (HRQOL, physiologic outcomes [eg, health conditions, mortality], health care utilization, health care costs, quality of care, or other); (10) the HRQOL PROs used in the study; (11) what context the PRO was collected in (by a provider at the point of care, by an insurer in a routine health risk assessment, by an employer, for a separate research project, and/or other); (12) whether the PROs were an dependent variable, independent variable, both, or other; and (13) the purpose of the article (to evaluate an insurer policy, intervention, or strategy; to identify or stratify individual patients/members; to evaluate quality of care not related to a specific initiative; and/or other).

All articles were abstracted by a team member and 1 of the 2 most experienced team members (J.H. and S.M.K.) performed a quality assurance check. Any discrepancies were discussed until consensus was reached.

Analyses

Abstracted data were exported to Excel (Microsoft) and SAS 9.4 (SAS Institute) to complete data manipulation and analyses. Frequencies of PRO uses were counted for the quantitative and mixed-methods articles. For the nonquantitative articles, 2 reviewers (B.G.G. and P.M.) used Excel and Word (Microsoft) to create a summary of each study; then, major findings were synthesized to condense their themes.

RESULTS

We identified 14,253 unduplicated records, of which 2340 passed abstract screening and 350 passed full-article screening. Seven records were identified through secondary searching. Full details of the screening process are in the [Figure](#).

The eAppendix Table includes the article title, journal, publication year, HRQOL PROs, and purpose(s) of the study. [Table 1](#) presents summary statistics of the data abstracted from the articles. The majority of the articles ($n = 299$; 85.4%) were quantitative studies. Within these 299, 124 (41.4%) were retrospective analyses, 70 (23.4%) were prospective, 60 (20.1%) were randomized controlled trials, 40 (13.4%) were cross-sectional studies, and 4 (1.3%) were other.

Data used in these studies are most concentrated in the late 1990s and early 2000s, and publication dates are evenly distributed over this time period (data not shown). The most common data source was data collected specifically for a research project. A total of 103 articles (29.4%) discussed or used data routinely collected by insurance companies: 11 (10.6%) of these were Consumer Assessment of Healthcare Providers and Systems surveys,¹⁹ 9 (8.7%) were the Medicare Health Outcomes Survey,²⁰ and 37 (35.9%) were the Medicare Current Beneficiary Survey (MCBS).²¹ Thirty-eight studies (10.8%) used data from other sources, primarily data sets collected by state or federal agencies for multiple purposes, such as the Medical Expenditures Panel Survey and the Behavioral Risk Factor Surveillance Survey.^{22,23} Just 34 (9.7%) articles discussed PROs or PROMs data collected by providers, and 10 of these were commentaries.

Seventy-five percent of the articles included individuals 65 years and older, but only 10% of the articles included children younger than 18 years. Of the 36 articles that included children, 22 were articles that addressed all ages, such as commentaries ($n = 7$) or reviews ($n = 2$).

[Table 2](#) displays the validated PROMs that were used in at least 5 quantitative or mixed-method articles and how the PROM was used. Each article could include multiple PROMs, so the total observations are larger than the number of articles. In 11%, the PROM was only used to describe the study subjects. The most common use of self-rated health (SRH), activities of daily living (ADL), and instrumental ADL (IADL) was as an adjustor in other analyses, often using Medicare data such as the MCBS to evaluate a policy (eg, Medicare Part D). Other PROMs were more likely to be used as outcomes. Of the 307 quantitative and mixed-methods articles, 74 used validated instruments other than SRH, ADL, or IADL (see eAppendix Table); 56 used nonvalidated measures; and 15 exclusively used nonvalidated measures.

Similarly, [Table 3](#) displays the validated measures in Medicare, Medicaid/CHIP, employer-sponsored/commercial, or VA insurance member populations. SRH (eg, "In general, my health is excellent, very good, good, fair, or poor") was used in more than half of the Medicare and Medicaid articles; in Medicare articles, SRH, ADL, and IADL were often coadministered in the same surveys. In contrast, the dominant PROMs in studies of VA membership were from the RAND/SF/

Veterans RAND (VR) family of measures (n = 16; 72.7%) (eg, the SF-36). There was not a PROM within the majority of employer-sponsored or commercial member studies, although the most common were SRH (n = 21; 33.3%) and the RAND/SF/VR family (n = 16; 25.4%). Studies of the VA membership were most likely to use a PROM about depression (n = 9; 40.9%), followed by studies of Medicare (n = 29; 20.1%), employer/commercial (n = 9; 14.3%), and Medicaid (n = 9; 14.1%) populations. The most common study purposes also varied to some degree by the insurer. For all insurers, the most common study purpose was to evaluate an insurer's policy (70.8% of Medicare articles, 87.5% of Medicaid articles, 74.1% of VA articles, and 71.9% of employer/commercial articles). In the remaining articles, the VA was more focused on identifying individuals (18.5%) than evaluating quality (7.4%), whereas Medicare had a slight focus on identifying individuals (16.0%) over evaluating quality (13.2%). Medicaid articles had a slightly greater focus on evaluating quality (7.8%) than on identifying individuals (4.7%). Articles from employer/commercial plans were evenly split between evaluating quality (14.1%) and identifying individuals (14.1%).

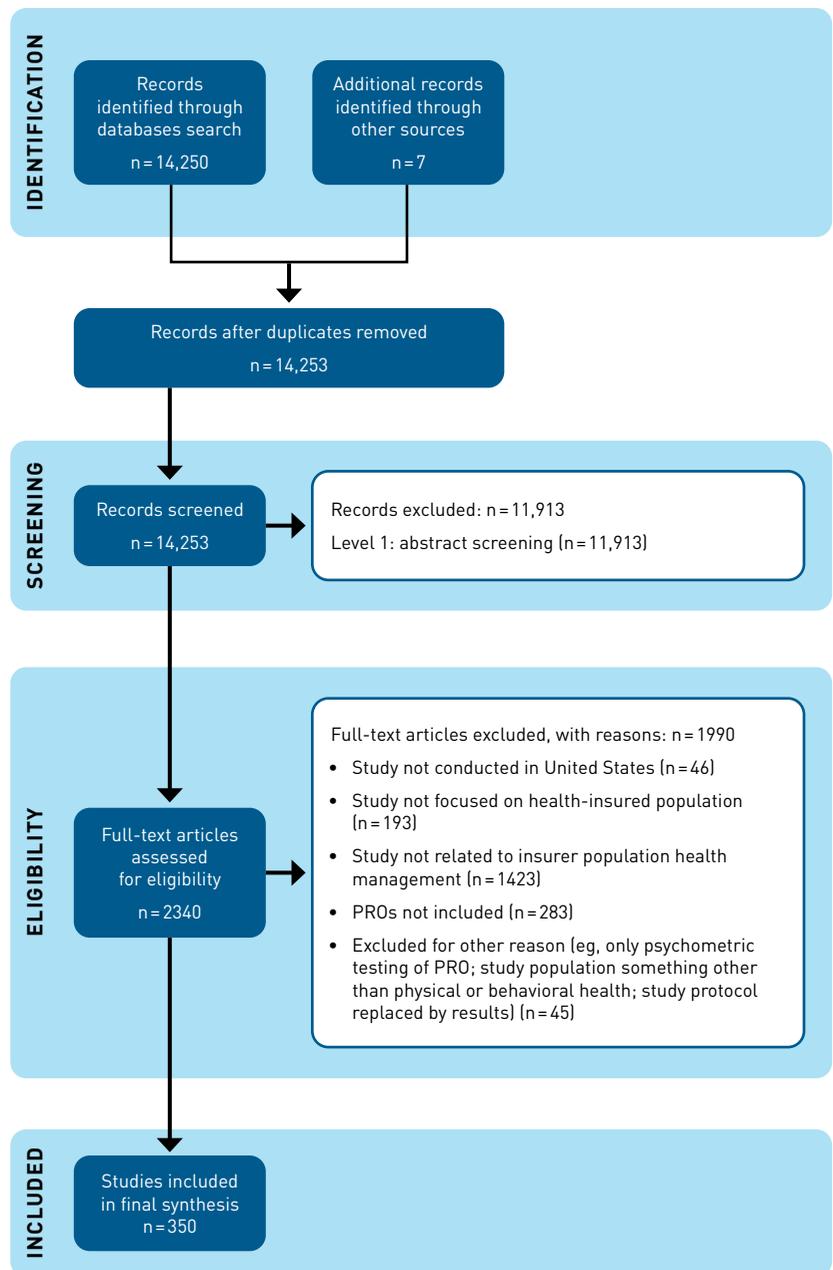
There were 34 nonquantitative articles, of which 50% were commentary or editorial papers, 34% were mixed-methods design, and 12% were review articles; there was a single white paper (2.9%) and a single qualitative-only design (2.9%). Common themes across these nonquantitative articles included (1) case management for stress management, chronic disease management (eg, hypertension, diabetes), or mental health management (eg, depression, schizophrenia); (2) reducing cost by predicting health care utilization and cost management of health care without compromising quality of care; (3) commentaries and editorials advising health care payers and policy makers about the best way to use PROs and the need for policy changes in the context of value-based care principles; and (4) general guidelines for implementation of PROs in specific disease management.

DISCUSSION

This scoping review covered 20 years of literature about the use of HRQOL PROs in US health-insured populations and found a wide array of articles. These articles were published in journals with a

focus on clinical practice, health services research, health economics, health policy, and managed care. The populations addressed in this work were also broad; they included such disparate groups as patients with cancer, osteoarthritis, migraine, depression, end-stage renal disease, schizophrenia, and asthma,²⁴⁻³¹ as well as general insurance members. The articles evaluated broad policy such as the impact of Medicare Part D; subgroup management strategies,

FIGURE. PRISMA Diagram



PRISMA, Preferred Reporting Items for Systematic reviews and Meta-Analyses; PRO, patient-reported outcome.

TABLE 1. Summary Statistics of the 350 Included Articles*

	Number of articles	Percent of articles
Type of study		
Quantitative	299	85.4%
Commentary	21	6.0%
Mixed methods	8	2.3%
Protocol	9	2.6%
Review	7	2.0%
Other	6	1.7%
Data source(s)		
Collected for research project	172	49.1%
Collected by insurer	103	29.4%
Collected by provider	34	9.7%
Collected by employer	13	3.7%
Other	38	10.9%
Outcome(s) of interest		
HRQOL PRO	198	56.6%
Health care utilization	139	39.7%
Health care cost	107	30.6%
Health care quality	91	26.0%
Health status	84	24.0%
Other	114	32.6%
Insurance type(s)		
Medicare fee-for-service	101	28.9%
Medicare Advantage	88	25.1%
Medicaid	65	18.6%
Employer-sponsored insurance	59	16.9%
Medicare Special Needs Plan	16	4.6%
Department of Veterans Affairs	26	7.4%
Commercial	23	6.6%
Other	73	20.8%

HRQOL, health-related quality of life; PRO, patient-reported outcome.

*Full statistics are available in the eAppendix Table.

such as telemonitoring; and the identification and management of individual patients, such as those with depression.³²⁻³⁴

More than half (n = 205; 59%) of the articles addressed Medicare (83 [24%] mentioned Medicare in the title) and often used large, publicly available data sets (eg, the MCBS) to evaluate policy changes, such as the addition of Part D.^{35,36} This scoping review highlights the common use cases of PROs by US health insurers as follows. First, private insurer data are much less available than government-sponsored data; although MCBS and many other government data sets are available to the public, data from other insured populations are largely proprietary business data or available via analytic data sets sold by companies such as IBM Watson Health.³⁷ Second, insurers do not have the same publish-or-perish mandates as academic researchers due to different professional incentives. That, coupled with the cost to obtain nongovernmental health insurer data, explains the relatively smaller number of studies in our search for these types of

insured populations. Third, as noted in the Methods section, it was a challenge to determine the motivation of academic researchers' use of government data sources and whether their results were used to inform insurers' decision-making. For example, although CMS chose to collect and report PROs, it is difficult to infer how PROs are driving CMS' programs.

An area of concern, from the measurement community's perspective, is that many insurance agencies lack the infrastructure and expertise to select validated measures and evaluate their internal programs with PROMs. Sixty articles used "homegrown" questionnaires for concepts that have existing validated questionnaires available (eg, pain, physical symptoms, self-efficacy, sleep). These studies include several studies of employer and insurer programs such as worksite health promotion programs, telephone and web interventions, and identification of high-risk members.³⁸⁻⁴⁰ Many also evaluated the impact of state-level Medicaid expansions.^{41,42} HRQOL measurement has a long history with questionnaires that are carefully constructed to ensure that PROMs actually capture the concept they purport to capture.⁴³ Also, new next-generation measures use modern measurement techniques, such as item response theory, which are highly flexible and adaptable to different needs, but they require some measurement background to be used to their full potential.⁴⁴ Thus, when insurers use PROs to evaluate programs and measure the health of their large member populations, validated PROMs are likely more accurate and reliable tools with which to perform meaningful and useful evaluation.

From this review, it appears that the insurance community has been a leader in using "generic" PROMs such as SRH, RAND/SF/VR measures, and ADLs. Generic measures are intended to provide an overall picture of someone's HRQOL, agnostic to their health conditions, unlike "disease-specific" measures that intentionally focus on a single condition.⁴⁵ Generic measures are appropriate for population-level management, such as an insured population, because they apply to all survey respondents. In contrast, disease-specific measures have had higher uptake in research and clinical settings that focus on particular diseases, where it is easier to ensure that targeted questionnaires are assigned correctly. When relevant, payers should engage with providers to select measures that are clinically actionable. This can ensure that proven measures are used and reduce the overall burden of questionnaires for patients. In this review, we found a handful of insured population studies using disease-specific measures for conditions such as asthma, migraine, and joint replacement.^{23,25,26,28-30} The Patient Reported Outcomes Measurement Information System, initially supported by the National Institutes of Health, is among the efforts currently underway to develop generic measures for research and clinical use.⁴⁶ Health insurers may have important insights about the use of generic measures to share with their clinical partners.

This review found 2 important areas with a paucity of articles. The first is pediatric populations; only 36 articles considered pediatric populations (often implicitly in broad discussions of PROMs), and only 14 articles explicitly focused on pediatric populations alone.

Although measurement of HRQOL in pediatric populations is more difficult than in adult populations because of proxy responders,⁴⁷ pediatric populations deserve the same attention to their QOL. The second is articles that use data collected by health care providers at the point of care (eg, collected routinely in clinical waiting rooms or within the electronic health record). Only 34 (10%) of articles discussed using data collected by providers, and 12 of these were commentaries, reviews, or protocols, leaving 22 (6%) using data from providers. The study of information collected at the point of care is particularly important because many alternative payment models, such as bundled payments with CMS,⁴⁸⁻⁵⁰ require collection of PROMs by the health service provider and a substantial integration of information from providers and payers to support these alternative models.

Limitations

This study was limited by difficulties in finding and identifying this literature. Despite the large number of included search terms and databases, we found few "grey literature" sources such as industry newsletters, so this search may be incomplete. As outlined in the Methods section, determining whether an article was truly addressing population health management from an insurer's perspective was complex and difficult to standardize across reviewers, so some articles may have been inappropriately excluded. Additionally, the intended use of academic articles often needed to be inferred by the reviewers.

CONCLUSIONS

The thoughtful use of PROMs can support health insurers' goals of measuring and demonstrating value. Supporting the use of validated questionnaires would improve the accuracy of value assessments. Despite the interest in alternative payment models that include PROMs, there is substantial need for guidance about how to collect and share these data among providers and insurers using patient-centered and rigorous methods. This review demonstrates wide interest in and use of PROMs among US health insurers, which provides a foundation for these future advancements. This review also provides a foundation for future studies to quantify the costs and values of PROMs for patients, providers, and payers. ■

TABLE 2. How HRQOL PROMs Were Used in Articles With Quantitative or Mixed-Methods Analyses (n=307)^a

PROM	Total articles	Outcome in any analysis	Used in analysis or study in another way (eg, as an adjustor, predictor, inclusion criteria)	Descriptive use only
SRH	138	34 (24.6%)	82 (59.4%)	22 (16.0%)
RAND, SF, or VR	84	59 (70.2%)	20 (23.8%)	5 (6.0%)
ADL	83	25 (30.1%)	50 (60.2%)	8 (9.6%)
IADL	59	17 (28.8%)	35 (59.3%)	7 (11.9%)
PHQ	24	15 (62.5%)	7 (29.3%)	2 (8.3%)
Other validated depression questionnaire	22	12 (54.5%)	8 (36.3%)	2 (9.1%)
CES-D	17	11 (64.7%)	6 (35.3%)	0 (0%)
Healthy Days	7	5 (71.4%)	0 (0%)	2 (28.6%)
Validated MSK questionnaire	6	3 (50.0%)	2 (33.3%)	1 (16.6%)
EQ-5D	5	4 (80.0%)	0 (0%)	1 (20.0%)

ADL, activities of daily living; CES-D, Center for Epidemiologic Studies Depression Scale; EQ-5D, EuroQol 5-dimension instrument; HRQOL, health-related quality of life; IADL, instrumental ADL; MSK, Musculoskeletal Health Questionnaire; PHQ, Patient Health Questionnaire-9; PROM, patient-reported outcome measure; SF, Short Form; SRH, self-rated health; VR, Veterans RAND.

^aThis table includes any PROM that was used in 5 or more articles. Percentages are by row.

TABLE 3. HRQOL PROMs Used in Quantitative or Mixed-Methods Analyses (n=260) by Insurance Type^a

PROM	Medicare (FFS, MA, and SNP) 144 articles	Medicaid/CHIP 64 articles	Employer-sponsored/commercial 63 articles	Department of Veterans Affairs 22 articles
SRH	80 (55.5%)	33 (51.6%)	21 (33.3%)	4 (18.2%)
RAND, SF, or VR	31 (21.5%)	12 (18.9%)	16 (25.4%)	16 (72.7%)
ADL	74 (51.4%)	8 (12.1%)	1 (1.6%)	5 (22.7%)
IADL	53 (36.8%)	4 (6.1%)	0 (0%)	5 (22.7%)
PHQ	10 (6.9%)	6 (9.1%)	3 (4.8%)	2 (9.1%)
Other validated depression questionnaire	10 (6.9%)	2 (3.0%)	2 (3.2%)	6 (27.3%)
CES-D	9 (6.3%)	1 (1.6%)	4 (6.3%)	1 (4.5%)
Healthy Days	1 (0.7%)	5 (7.6%)	1 (1.6%)	0 (0%)
Validated MSK questionnaire	3 (2.1%)	1 (1.6%)	3 (4.8%)	0 (0%)
EQ-5D	1 (0.7%)	1 (1.6%)	2 (6.3%)	0 (0%)

ADL, activities of daily living; CES-D, Center for Epidemiologic Studies Depression Scale; CHIP, Children's Health Insurance Program; EQ-5D, EuroQol 5-dimension instrument; FFS, fee-for-service; HRQOL, health-related quality of life; IADL, instrumental ADL; MA, Medicare Advantage; MSK, Musculoskeletal Health Questionnaire; PHQ, Patient Health Questionnaire-9; PROM, patient-reported outcome measure; SF, Short Form; SNP, Special Needs Plan; SRH, self-rated health; VR, Veterans RAND.

^aThis table includes any PROM that was used in 5 or more articles. A single article can be in multiple columns (eg, both Medicare and Department of Veterans Affairs). Percentages are by column.

Acknowledgments

The authors would like to thank Eric Chan, PhD, and Emre Yücel, PhD, for their contributions, which provided insight and expertise that greatly assisted the research.

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Source of Funding: Funding for Dr Hanmer and Ms McCracken was provided by the Wolff Center at UPMC. Funding for Dr Kinsky and Ms Swart was provided by UPMC Insurance Services Division.

Author Disclosures: Dr Hanmer, Ms McCracken, Ms Swart, and Dr Kinsky are employed by UPMC. Dr Cizik is a grant consultant for the University of Washington on a National Institutes of Health grant studying the use of patient-reported outcomes to determine phenotypes in low back pain and is the principal investigator funded on an Orthopaedic Research and Education Foundation grant using patient-reported outcomes in trauma patients. The remaining authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article.

Authorship Information: Concept and design (JH, AMC, BGG, RT, SMK); acquisition of data (AMC, BGG, PM, RT, SMK); analysis and interpretation of data (JH, AMC, BGG, PM, ECSS, SMK); drafting of the manuscript (JH, AMC, BGG, PM, ECSS, RT, SMK); critical revision of the manuscript for important intellectual content (JH, AMC, BGG, PM, SMK); statistical analysis (JH); provision of patients or study materials (AMC, BGG); obtaining funding (JH); administrative, technical, or logistic support (PM, ECSS, SMK); and supervision (JH, SMK).

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eAppendix Table.

Title	Journal	Year	PROs Used	Purpose
Commentaries and Editorials				
Dissemination of methods and results from the veterans health study: final comments and implications for future monitoring strategies within and outside the veterans healthcare system	J Ambul Care Manage	2006	VR-12, VR-36, Unspecified validated questionnaire(s)	To evaluate a group level policy; to stratify individual members evaluate quality of care
HEDIS antidepressant medication management measures and performance-based measures: an opportunity for improvement in depression care	Am J Manag Care	2007	PHQ-2, PHQ-9	To evaluate quality of care
How the ESRD quality incentive program could potentially improve quality of life for patients on dialysis	Clin J Am Soc Nephrol	2015	KDQOL, ICH CAHPS, Unspecified validated questionnaire(s)	To evaluate a group level policy
Implementation of a feedback system in a managed care environment: what are patients teaching us?	J Clin Psychol	2005	OQ-30, LSQ, Y0Q-30	To evaluate a group level policy
Improving asthma outcomes in large populations	J Allergy Clin Immunol	2011	ACT, AQLQ, ATAQ, ASMIS	To identify or stratify individual members
Incorporating health status in routine care to improve health care value: the VA Patient Reported Health Status Assessment (PROST) System	Jama	2016	SAQ-7, RDS	To identify or stratify individual members
Measuring the effects of lifestyle interventions on health care costs	J Am Diet Assoc	2007	SF-36, HUI, QWB	To evaluate a group level policy
Methodological considerations in using patient reported measures in dialysis clinics	J Patient Rep Outcomes	2017	KDQOL-36, ICH-CAHPS, PROMIS Global Health	To evaluate quality of care
Moving toward paying for outcomes in Medicaid	J Ambul Care Manage	2018	Unspecified validated questionnaire(s)	To evaluate a group level policy
Opportunities for improving managed care for individuals with dementia: Part 2--A framework for care	Am J Manag Care	1999	Unspecified questionnaire(s)	To evaluate quality of care
Patient-Reported Outcome Measures-what data do we really need?	J Arthroplasty	2016	KOOS, SF-12, SF-36, VR-12, VR-36, PROMIS Global 10, KSS, HHS, WOMAC, OHS, OKS, HOOS, KOOS-PS, HOOS-PS, KOOS JR, HOOS JR	To evaluate a group level policy
Policy-relevant research: when does it matter?	NeuroRx	2004	Unspecified validated questionnaire(s)	To evaluate a group level policy; to identify or stratify individual members
Pursuing perfection. Minnesota healthcare organization uses EBM and process re-engineering to successfully apply best practices to the treatment of depression	Health Manag Technol	2004	PHQ-9	To identify or stratify individual members
Quality and value in an evolving health care landscape	J Hand Surg Am	2016	Unspecified validated questionnaire(s)	To evaluate a group level policy
Quality of care measures for migraine: a comprehensive review	Dis Manag	2007	24-Hr-MQOLQ, MSQOL, MSQ v2.1, MIDAS, HDI, HImQ, HIT, MTAQ, Migraine ACT	To evaluate quality of care
Role of perspective and unspecified uncertainties in cost-effectiveness assessments in advanced prostate cancer	J Natl Cancer Inst	2000	Unspecified validated questionnaire(s)	Unspecified

The Medicare Health Outcomes Survey program: overview context and near-term prospects	Health Qual Life Outcomes	2004	ADL, SF-36	To evaluate quality of care
The next frontier in quality measurement: how patients feel	Mod Healthc	2017	Unspecified validated questionnaire(s)	To evaluate quality of care; unspecified
Value from the patients' and payers' perspectives	Anesthesiol Clin	2015	Unspecified validated questionnaire(s)	To evaluate quality of care
Value-based care in hepatology	Hepatology	2017	Unspecified validated questionnaire(s)	To evaluate quality of care
Value-based purchasing for osteoarthritis and total knee arthroplasty: what role for patient-reported outcomes?	J Am Acad Orthop Surg	2017	KOOS, VR-12, PROMIS-global, KOOS Jr.	Unspecified
Mixed-Method Articles				
Changes in health and ability to work among Medicaid expansion enrollees: a mixed methods study	J Gen Intern Med	2019	SRH, Non-validated questionnaire(s)	To evaluate a group level policy
Diagnosis and care of chronic health conditions among Medicaid expansion enrollees: a mixed-methods observational study	J Gen Intern Med	2019	SRH, Healthy Days, Non-validated questionnaire(s)	To evaluate a group level policy
Employee input and health care cost-containment strategies	Manag Care Interface	2003	SRH	To evaluate a group level policy
How do mobile phone diabetes programs drive behavior change? Evidence from a mixed methods observational cohort study	Diabetes Educ	2014	DSES, Non-validated questionnaire(s)	To evaluate a group level policy
Implementing lifestyle medicine with medication therapy management services to improve patient-centered health care	J Am Pharm Assoc (2003)	2011	Healthy Days	To evaluate a group level policy
Perspectives from deductible plan enrollees: plan knowledge and anticipated care-seeking changes	BMC Health Serv Res	2009	SRH	To evaluate a group level policy
The effect of Medicaid on management of depression: evidence from the Oregon Health Insurance Experiment	Milbank Quarterly	2018	PHQ-9	To evaluate a group level policy
Value tools in managed care decision making: current hurdles and future opportunities	J Manag Care Spec Pharm	2017	Unspecified validated questionnaire(s)	To evaluate a group level policy
Unspecified Articles				
Determination of multiple sclerosis indicators for value-based contracting using the delphi method	J Manag Care Spec Pharm	2019	GNDS, PDDS, MSIS-29	To evaluate quality of care
Cost and quality impact of Intermountain's Mental Health Integration Program	J Healthc Manag	2010	PHQ-9	To identify or stratify individual members
Payer perspectives on patient-reported outcomes in health care decision making: oncology examples	J Manag Care Spec Pharm	2017	Unspecified validated questionnaire(s)	To evaluate a group level policy
The Kaiser Permanente northern California adult member health survey	Perm J	2016	SRH, ADL, IADL, Unspecified validated questionnaire(s)	To identify or stratify individual members; to evaluate quality of care; unspecified
Protocol Articles				
The wellness incentives and navigation project: design and methods	BMC Health Serv Res	2015	SF-12	To evaluate a group level policy

Addressing basic needs to improve diabetes outcomes in Medicaid beneficiaries	https://clinicaltrials.gov/show/nct03940209	2019	SF-12	To evaluate a group level policy
Addressing disparities in lupus care through an integrated care management program	https://clinicaltrials.gov/show/NCT03915652	2019	SLAQ, PROMIS Global Health, MHI-5	To evaluate a group level policy
Contra Costa Health Services whole person care (CommunityConnect) program evaluation	https://clinicaltrials.gov/show/nct04000074	2019	SRH	To evaluate a group level policy
Development of a migraine disease management initiative in a managed care plan	Dis Manag Health Out	2002	SF-12, MTAQ, MIDAS	To evaluate a group level policy
Keep it off: a phone-based intervention for long-term weight-loss maintenance	Contemp Clin Trials	2011	SSEBQ, CES-D, BSQ, Non-validated questionnaire(s)	To evaluate a group level policy
Population-based tobacco treatment: study design of a randomized controlled trial	BMC Public Health	2012	Unspecified validated questionnaire(s)	To evaluate a group level policy
Retrospective a of VitalCare a on Scott and White chronically ill beneficiaries	https://clinicaltrials.gov/show/nct01912430	2013	PHQ-9	To evaluate a group level policy
The Michigan spine surgery improvement collaborative: a statewide collaborative quality initiative	Neurosurg Focus	2015	EQ5D, ODI, NDI, mJOA, NASS Lumbar, NRS	To evaluate quality of care
Qualitative Articles				
Do prominent quality measurement surveys capture the concerns of persons with disability?	Disabil Health J	2017	Unspecified validated questionnaire(s), Non-validated questionnaire(s)	To evaluate quality of care
Quantitative Articles				
12-Month cost-effectiveness of telephone delivered collaborative care for treating post-CABG depression	Psychosom Med	2012	SF-36, HDRS	To evaluate a group level policy
A budget impact analysis of telemedicine-based collaborative care for depression	Med Care	2011	PHQ-9, SF-12, SCL-20, MC-QWB	To evaluate a group level policy
A classroom mind/body wellness intervention for older adults with chronic illness: comparing immediate and 1-year benefits	Behav Med	2001	SF-36, MSCL, SFMPQ, BAI, CES-D, SF-LSI, MHLC	To evaluate a group level policy
A comparative analysis of Medicaid long-term care policies and their effects on elderly dual enrollees	Health Econ	2009	SRH, ADL, IADL	To evaluate a group level policy
A comparison of two methods for identifying frail Medicare-aged persons	J Am Geriatr Soc	2002	SFH, ADL, IADL, Rosow-Breslau Scale	To identify or stratify individual members
A controlled trial of inpatient and outpatient geriatric evaluation and management	N Engl J Med	2002	ADL, SF-36	To evaluate a group level policy
A multi-site study of Medicaid-funded managed care versus fee-for-service plans' effects on mental health service utilization of children with severe emotional disturbance	J Behav Health Serv Res	2004	SF-12, CBCL, CIS, CHQ	To evaluate a group level policy
A novel stress and coping workplace program reduces illness and healthcare utilization	Psychosom Med	2002	SCI, STAI	To evaluate a group level policy

A randomized clinical trial of outpatient geriatric evaluation and management	J Am Geriatr Soc	2001	SRH, SIP-PFD, GDS, BDDs, RADs	To evaluate a group level policy
A randomized controlled open trial of population-based disease and case management in a Medicare plus choice health maintenance organization	Prev Chronic Dis	2004	SF-36	To evaluate a group level policy
A randomized trial of population-based clinical decision support to manage health and resource use for Medicaid beneficiaries	J Med Syst	2013	SRH, EQ5D	To evaluate a group level policy
A randomized trial of telemonitoring heart failure patients	J Healthc Manag	2010	SRH, PHQ-9, SF-12, SEMCD, HLC	To evaluate a group level policy
A structural equation modeling approach to examining the predictive power of determinants of individuals' health expenditures	J Med Syst	2002	SF-36	To identify or stratify individual members
A study of efficacy and cost-effectiveness of guided imagery as a portable self-administered presurgical intervention delivered by a health plan	Adv Mind Body Med	2007	Non-validated questionnaire(s)	To evaluate a group level policy
Acupuncture for chronic pain in the Vermont Medicaid population: a prospective pragmatic intervention trial	Glob Adv Health Med	2018	PROMIS-29	To evaluate a group level policy
Adjusting pediatric Consumer Assessment of Health Plans Study (CAHPS) scores to ensure fair comparison of health plan performances	Med Care	2005	SRH	To identify or stratify individual members
Advanced illness index: predictive modeling to stratify elders using self-report data	J Palliat Med	2006	ADL, IADL	To identify or stratify individual members
Are smoking and alcohol misuse associated with subsequent hospitalizations for ambulatory care sensitive conditions?	J Behav Health Serv Res	2011	MHI-5	To evaluate a group level policy
Are the healthy behaviors of US high-deductible health plan enrollees driven by people who chose these plans? Smoking as a case study	PLoS One	2013	SRH	To evaluate a group level policy
Assessing PPO performance on prevention and population health	Med Care Res Rev	2001	SRH	To evaluate quality of care
Assessments of medical care by enrollees in for-profit and nonprofit health maintenance organizations	N Engl J Med	2002	SRH	To evaluate quality of care
Association and Medicare total annual cost of care: implications for value-based payment	JAMA Intern Med	2018	ADL, IADL	To evaluate a group level policy
Association of asthma control with health care utilization: a prospective evaluation.	Am J Respir Crit Care Med	2002	ATAQ	To identify or stratify individual members
Association of Health Plans' Healthcare Effectiveness Data and Information Set (HEDIS) performance with outcomes of enrollees with diabetes	Med Care	2010	SF-36	To evaluate quality of care
Association of Medicare's bundled payments for care improvement initiative with patient-reported outcomes	Health Serv Res	2019	ADL, SF-36, Non-validated questionnaire(s)	To evaluate a group level policy
Association of patient social cognitive and functional risk factors with preventable hospitalizations: implications for physician value-based payment	J Gen Intern Med	2019	ADL, IADL	To evaluate a group level policy

Better outcomes lower costs: palliative care program reduces stress costs of care for children with life-threatening conditions	Policy Brief UCLA Cent Health Policy Res	2012	Non-validated questionnaire(s)	To evaluate a group level policy
Body mass index and the impact of a health promotion intervention on health services use and expenditures	J Aging Health	2011	ADL, IADL	To evaluate a group level policy
Can depression treatment in primary care reduce disability? A stepped care approach	Arch Fam Med	2000	SF-36, NEO, SCL-20, SDS	To evaluate a group level policy
Can lay health workers promote better medical self-management by persons living with HIV? An evaluation of the Positive Choices program	Patient Educ Couns	2012	SF-12	To evaluate a group level policy
Can utility-weighted health-related quality-of-life estimates capture health effects of quality improvement for depression?	Med Care	2001	SF-12, SF-36	To evaluate a group level policy
Care coordination assisted by technology for multiethnic caregivers of persons with dementia: a pilot clinical demonstration project on caregiver burden and depression	J Telemed Telecare	2008	IADL, SF-36, ZBI, CES-D, COPE	To evaluate a group level policy
Care coordination to target patient complexity and reduce disparities in primary care	Public Health Nurs	2019	SRH, PHQ-4, Healthy Days	To identify or stratify individual members
Caregiver education and support: results of a multi-site pilot in an HMO	Home Health Care Serv Q	2002	SRH, ADL, IADL, Non-validated questionnaire(s)	To evaluate a group level policy
Case finding with incomplete administrative data: observations on playing with less than a full deck	Popul Health Manag	2010	SRH	To identify or stratify individual members
Case manager-defined roles in the Medicare Alzheimer's Disease Demonstration: relationship to client and caregiver outcomes	Care Manag J	1999	ADL, IADL, GDS, MBPC, CBS	To evaluate a group level policy
Case-mix adjustment and the comparison of community health center performance on patient experience measures	Health Serv Res	2010	SRH	To evaluate quality of care
Center of excellence for headache care: group model at Kaiser Permanente	Headache	2003	SF-36, MSQ, Non-validated questionnaire(s)	To evaluate a group level policy
Changes in case-mix and health outcomes of Medicare Fee-For-Service beneficiaries and Managed Care enrollees during the years 1992-2011	Med Care	2018	SRH, ADL, IADL, CES-D	To evaluate a group level policy
Changes in Medicare reimbursement and patient-nephrologist visits quality of care and health-related quality of life	Am J Kidney Dis	2005	KDQOL-SF	To evaluate a group level policy
Changes in reported health status and unmet need for children enrolling in the Kansas Children's Health Insurance Program	Am J Public Health	2003	SRH	To evaluate a group level policy
Changes in self-reported general health physical health and mental health following the affordable care act's Medicaid expansion	J Gen Intern Med	2017	SRH, Healthy Days	To evaluate a group level policy
Changes in self-reported health healthcare access and smoking cessation among low-income Michigan adults after-Medicaid expansion under the Affordable Care Act	J Gen Intern Med	2016	Healthy Days	To evaluate a group level policy
Characteristics and health needs of veterans with unspecified-than-honorable discharges: expanding eligibility in the Veterans Health Administration	Mil Med	2018	SF-12	Unspecified

Characteristics of newly enrolled members of an integrated delivery system after the Affordable Care Act	Perm J	2015	SRH	To evaluate a group level policy
Chronic care clinics for diabetes in primary care: a system-wide randomized trial	Diabetes Care	2001	SF-36, CES-D, RAD	To evaluate a group level policy
Chronic care clinics: a randomized controlled trial of a new model of primary care for frail older adults	J Am Geriatr Soc	1999	SF-36, CES-D	To evaluate a group level policy
Chronic pain management in a health maintenance organization	Clin J Pain	1999	MPS	To evaluate a group level policy
Clinical and economic outcomes of a pilot project examining pharmacist-focused collaborative care treatment for depression	J Am Pharm Assoc (2003)	2011	PHQ-9	To evaluate a group level policy
Cognition and take-up of subsidized drug benefits by Medicare beneficiaries	JAMA Intern Med	2013	SRH, ADL, CES-D	To evaluate a group level policy
Coherence and health care cost--RCA actuarial study: a cost-effectiveness cohort study	Altern Ther Health Med	2010	Non-validated questionnaire(s)	To evaluate a group level policy
Community health worker home visits for Medicaid-enrolled children with asthma: effects on asthma outcomes and costs.	Am J Pub health	2015	PACQLQ, Non-validated questionnaire(s)	To evaluate a group level policy
Community pharmacist led employer-based wellness services: a pilot study	Res Social Adm Pharm	2019	EQ5D	To evaluate a group level policy
Community pharmacy-based hypertension disease-management program in a Latino/Hispanic-American population	Consult Pharm	2007	SF-12	To evaluate a group level policy
Community-based health coaching exercise and health service utilization	J Aging Health	2005	SRH, ADL, IADL, GDS, GADS, Non-validated questionnaire(s)	To evaluate a group level policy
Comparative effectiveness of usual care with or without chiropractic care in patients with recurrent musculoskeletal back and neck pain	J Gen Intern Med	2018	EQ5D, GAD-7, PHQ-8, BPI, ISI	To evaluate a group level policy
Comparing post-acute rehabilitation use length of stay and outcomes experienced by Medicare Fee-For-Service and Medicare Advantage beneficiaries with hip fracture in the United States: A secondary analysis of administrative data	PLoS Med	2018	ADL	To evaluate a group level policy
Comparing survey-based frailty assessment to Medicare claims in predicting health outcomes and utilization in Medicare beneficiaries	J Aging Health	2019	IADL	To identify or stratify individual members
Comparing the health care experiences of Medicare beneficiaries with and without depressive symptoms in Medicare Managed Care versus Fee-for-Service	Health Serv Res	2016	PHQ-2	To evaluate a group level policy
Comparison of functional outcomes associated with hospital at home care and traditional acute hospital care	J Am Geriatr Soc	2009	ADL, IADL, GDS	To evaluate a group level policy
Comparison of performance of traditional Medicare vs Medicare Managed Care	Jama	2004	SRH	To evaluate quality of care
Comparison of stress experienced by family members of patients treated in hospital at home with that of those receiving traditional acute hospital care	J Am Geriatr Soc	2008	SRH, ADL, IADL, GDS, Non-validated questionnaire(s)	To evaluate a group level policy
Correlating physical and mental health status with satisfaction in a health plan	Manag Care Interface	2001	SF-12	To evaluate quality of care

Cost and outcomes of Medicare reimbursement for HMO preventive services	Health Care Financ Rev	1999	SRH, ADL, IADL, GSE, QWB, CES-D	To evaluate a group level policy
Cost-effectiveness of supported employment for veterans with spinal cord injuries	Arch Phys Med Rehab	2014	SF-36	To evaluate a group level policy
Cost-related medication nonadherence among beneficiaries with depression following Medicare Part D	Am J Geriatr Psychiatry	2009	SRH, ADL	To evaluate a group level policy
Cost-related medication nonadherence and spending on basic needs following implementation of Medicare Part D	Jama	2008	SRH	To evaluate a group level policy
Cost-related medication nonadherence in older patients with rheumatoid arthritis	J Rheumatol	2013	SRH	To evaluate a group level policy
Cost-related nonadherence in the Medicare program: the impact of Part D	Med Care	2011	SRH	To evaluate a group level policy
Cost-sharing: patient knowledge and effects on seeking emergency department care	Med Care	2004	SRH	To evaluate a group level policy
Covariates of depression and high utilizers of healthcare: Impact on resource use and costs	J Psychosom Res	2016	GAD-7, QIDS, GHQ-12, ATHIS, BPI	To identify or stratify individual members
Demand response of mental health services to cost sharing under managed care	J Ment Health Policy Econ	2008	SRH, ADL	To evaluate a group level policy
Demographic and clinical characteristics of individuals utilizing an internet-based digital coaching program for recovering from binge eating	Int J Eat Disord	2011	SRH	To evaluate a group level policy
Depression and Coleman Care Transitions Intervention	Soc Work Health Care	2018	PHQ-9	To evaluate a group level policy
Depressive symptoms in older people predict nursing home admission	J Am Geriatr Soc	2006	ADL, PHQ-2	To identify or stratify individual members
Development of a method to identify seniors at high risk for high hospital utilization	Med Care	2002	ADL, CES-D, Rosow-Breslau scale	To identify or stratify individual members
Diabetes disease management in managed care organizations	Dis Manag	2004	Non-validated questionnaire(s)	To evaluate a group level policy
Did Medicare Advantage payment cuts affect beneficiary access and affordability?	Am J Manag Care	2019	SRH	To evaluate a group level policy
Did Medicare Part D affect national trends in health outcomes or hospitalizations? A time-series analysis	Ann Intern Med	2015	SRH, ADL, IADL	To evaluate a group level policy
Differences in hospitalizations between Fee-for-Service and Medicare Advantage beneficiaries	Med Care	2019	SRH	To evaluate a group level policy
Differences in receipt of three preventive health care services by race/ethnicity in Medicare Advantage plans: tracking the impact of pay for performance 2010 and 2013	Prev Chronic Dis	2016	SRH, ADL	To evaluate a group level policy
Dimensions of plan performance for sick and healthy members on the Consumer Assessments of Health Plans Study 2.0 survey	Med Care	2002	SRH, ADL, IADL	To evaluate quality of care
Disability outcomes of older Medicare HMO enrollees and Fee-For-Service Medicare beneficiaries	J Am Geriatr Soc	2001	SRH, ADL, IADL	To evaluate a group level policy
Does Managed Care improve access to care for Medicaid beneficiaries with disabilities? A national study	Inquiry	2008	SRH, ADL, IADL	To evaluate quality of care

Does telephone care management help Medicaid beneficiaries with depression?	Am J Manag Care	2011	PHQ-9, QIDS-SR	To evaluate a group level policy
Drug use patterns in severely mentally ill Medicare beneficiaries: impact of discontinuities in drug coverage	Health Serv Res	2008	SRH	To evaluate a group level policy
Effect of a workplace wellness program on employee health and economic outcomes: a randomized clinical trial	Jama	2019	PHQ-2, SF-8, Non-validated questionnaire(s)	To evaluate a group level policy
Effect of clinical and attitudinal characteristics on obtaining comprehensive medication reviews	J Manag Care Spec Pharm	2016	SRH	To evaluate a group level policy
Effect of cost sharing on prescription drug use by Medicare beneficiaries prior to the Medicare drug benefit and potential adverse selection in the benefit	J Am Pharm Assoc (2003)	2009	SRH	To evaluate a group level policy
Effect of Medicaid Managed Care on racial disparities in health care access	Health Serv Res	2007	SRH	To evaluate a group level policy
Effect of prescription drug coverage on health of the elderly	Health Serv Res	2008	SRH, ADL, IADL	To evaluate a group level policy
Effective and viable mind-body stress reduction in the workplace: a randomized controlled trial	J Occup Health Psychol	2012	PSS, PSQI, CES-D, WLQ, Non-validated questionnaire(s)	To evaluate a group level policy
Effectiveness of cognitive-behavioral treatment for panic disorder versus treatment as usual in a managed care setting	J Consult Clin Psychol	2004	PDSS, FQ, BDI, OQ-45, TCQ	To evaluate a group level policy
Effectiveness of team treatment of depression in primary care	https://clinicaltrials.gov/show/nct00012766	2001	SF-36, SCL-20, SDS	To evaluate a group level policy
Effectiveness of the 5-As tobacco cessation treatments in nine HMOs	J Gen Intern Med	2009	SRH, Non-validated questionnaire(s)	To evaluate a group level policy
Effects of an asthma management program on the asthmatic member: patient-centered results of a 2-year study in a managed care organization.	Am J Manag care	1998	SF-36, AQAS, CHQ-PF50	To evaluate a group level policy
Effects of collaborative drug therapy management on patients' perceptions of care and health-related quality of life	Res Social Adm Pharm	2006	SF-12, SF-36	To evaluate a group level policy
Effects of cost-containment strategies within managed care on continuity of the relationship between patients with depression and their primary care providers	Med Care	2001	SF-12, CES-D	To evaluate a group level policy
Effects of Medicare Part D on disparity implications of medication therapy management eligibility criteria	Am Health Drug Benefits	2014	SRH, ADL, IADL	To evaluate a group level policy
Effects of Medicare Part D on racial/ethnic disparities in hospital utilization among seniors	J Aging Health	2015	SRH, ADL, IADL	To evaluate a group level policy
Effects of the ACA on preventive care disparities	Appl Health Econ Health Policy	2018	SRH	To evaluate a group level policy
Effects of the Medicare Alzheimer's disease demonstration on Medicare expenditures	Health Care Financ Rev	1999	ADL, IADL, CBS, GDS	To evaluate a group level policy
Efficacy of nurse telehealth care and peer support in augmenting treatment of depression in primary care	Arch Fam Med	2000	SF-12, HDRS, BDI	To evaluate a group level policy

Evaluating depression care management in a community setting: main outcomes for a Medicaid HMO population with multiple medical and psychiatric comorbidities	Depress Res Treat	2012	PHQ-9	To evaluate a group level policy
Evaluating the performance of Medicare Fee-For-Service providers using the health outcomes survey: a comparison of two methods	Med Care	2005	SF-36	To evaluate quality of care
Evaluation of an asthma disease management program in a Medicaid population	Dis Manag Health Out	2006	Non-validated questionnaire(s)	To evaluate a group level policy
Evaluation of an integrated workers' compensation/managed care pharmacy benefit program: employee satisfaction and health outcomes	Manag Care Interface	2005	SRH	To evaluate a group level policy
Evaluation of nationally mandated drug use reviews to improve patient safety in nursing homes: a natural experiment	J Am Geriatr Soc	2005	SRH	To evaluate quality of care
Evaluation of the home and community-based services brain injury Medicaid Waiver Programme in Colorado	Brain Inj	2003	ADL, IADL, SF-12, CHART-SF, SIP-AB, SWLS	To evaluate a group level policy
Expanding mental health services to older high-utilizing HMO patients: a pilot study	J Clin Psychol Med Settings	2001	SF-36, SCL-90-R	To evaluate a group level policy
Expansion of Medicaid covered smoking cessation services: maternal smoking and birth outcomes	Medicare Medicaid Res Rev	2013	Non-validated questionnaire(s)	To evaluate a group level policy
Feasibility of distinguishing performance among provider groups using patient-reported outcome measures in older adults with multiple chronic conditions	Med Care	2019	RAND-12, VR-36, PROMIS-29	Unspecified
Findings from a national survey of Medicare beneficiary perspectives on the Medicare Part D medication therapy management standardized format	J Manag Care Spec Pharm	2019	SRH	To evaluate a group level policy
Findings from the 2009 EBRI/MGA Consumer Engagement in Health Care Survey	EBRI Issue Brief	2009	SRH	To evaluate quality of care
Fitness memberships and favorable selection in Medicare Advantage plans	N Engl J Med	2012	SRH, VR-12, Non-validated questionnaire(s)	To evaluate a group level policy
Free nicotine patches plus proactive telephone peer support to help low-income women stop smoking	Prev Med	2000	Non-validated questionnaire(s)	To evaluate a group level policy
Functional health outcomes as a measure of health care quality for Medicare beneficiaries	Health Serv Res	2001	SRH, ADL, SF-36, Non-validated questionnaire(s)	To evaluate quality of care
Generalist care managers for the treatment of depressed Medicaid patients in North Carolina: a pilot study	BMC Fam Pract	2007	PHQ-9, SF-12, HAM-D	To evaluate a group level policy
Generic-only drug coverage in the Medicare Part D gap and effect on medication cost-cutting behaviors for patients with diabetes mellitus: the translating research into action for diabetes study	J Am Geriatr Soc	2010	SRH	To evaluate a group level policy
Geographic area variations in the Medicare health plan era	Med Care	2010	SRH	To evaluate a group level policy
Geriatric evaluation and management units in the care of the frail elderly cancer patient	J Gerontol A Biol Sci Med Sci	2005	ADL, IADL, SF-36	To evaluate a group level policy
Glycemic control and health disparities in older ethnically diverse underserved adults with diabetes five-year results from the	Diabetes Care	2011	SF-12, CARE, LSNS	To evaluate a group level policy

Informatics for Diabetes Education and Telemedicine (IDEATel) study				
Guideline recommendations for treatment of schizophrenia: the impact of managed care	Arch Gen Psychiatry	2003	SF-12, BASIS-32, LSP	To evaluate a group level policy
Has Medicare Part D reduced racial/ethnic disparities in prescription drug use and spending?	Health Serv Res	2014	SRH, SF-12	To evaluate a group level policy
Headache management program improves outcome for chronic headache	Headache	2003	SF-36, MIDAS, Non-validated questionnaire(s)	To evaluate a group level policy
Health and loyalty promotion visits for new enrollees: results of a randomized controlled trial	Patient Educ Couns	2001	SRH	To evaluate a group level policy
Health outcomes. new quality measure for Medicare	Int J Qual Health Care	2001	SRH, ADL, SF-36	To evaluate quality of care
Health plan requirements for mental health and substance use screening in primary care	J Gen Intern Med	2007	Non-validated questionnaire(s)	To evaluate a group level policy; to identify or stratify individual members
Health plans' disease management programs: extending across the medical and behavioral health spectrum?	J Ambul Care Manage	2008	Non-validated questionnaire(s)	Unspecified
Health promotion in the operating room--a quality improvement project	Aorn j	2006	SF-36	To evaluate a group level policy
Health services appraisal and the transition to Medicaid Managed Care from Fee-for-service	Disabil Health J	2016	SF-12	To evaluate a group level policy
Health status and heterogeneity of cost-sharing responsiveness: how do sick people respond to cost-sharing?	Health Econ	2003	SRH, ADL	To evaluate a group level policy
Hearing aid effectiveness after aural rehabilitation - individual versus group (HEARING) trial: RCT design and baseline characteristics	BMC Health Serv Res	2009	PHQ-9, SF-12	To evaluate a group level policy
High-risk population health management - achieving improved patient outcomes and near-term financial results	A Journal Manag Care	2000	SRH, Non-validated questionnaire(s)	To evaluate a group level policy
Home telehealth reduces healthcare costs	Telemed J E Health	2004	SRH, OMFAQ, Non-validated questionnaire(s)	To evaluate a group level policy
Hospice effect on government expenditures among nursing home residents	Health Serv Res	2008	ADL	To evaluate a group level policy
Hospitalization in the Program of All-Inclusive Care for the Elderly (PACE): rates concomitants and predictors	J Am Geriatr Soc	2000	SRH, ADL, IADL	To identify or stratify individual members
How do the experiences of Medicare beneficiary subgroups differ between Managed Care and original Medicare?	Health Serv Res	2011	SRH	To evaluate a group level policy
How well does a single question about health predict the financial health of Medicare managed care plans?	Eff Clin Pract	1999	SRH, ADL, IADL, Non-validated questionnaire(s)	To identify or stratify individual members
Impact of a seizure disorder disease management program on patient-reported quality of life	Dis Manag	2004	QOLIE-31	To evaluate a group level policy
Impact of a senior fitness program on measures of physical and emotional health and functioning	Popul Health Manag	2013	SRH, ADL, Healthy Days, Non-validated questionnaire(s)	To evaluate a group level policy
Impact of a value-based insurance design for back pain on health plan member satisfaction and its implications for patient outcomes	Popul Health Manag	2015	ODI, NDI	To evaluate a group level policy

Impact of cost sharing on prescription drugs used by Medicare beneficiaries	Res Social Ad Pharm	2010	SRH	To evaluate a group level policy
Impact of drug coverage on medical expenditures among the elderly	Health Care Financ Rev	2007	SRH	To evaluate a group level policy
Impact of generosity level of outpatient prescription drug coverage on prescription drug events and expenditure among older persons	Am J Public Health	2002	SRH, ADL, IADL	To evaluate a group level policy
Impact of NSAIDs prior authorization policy on patients' QoL	Ann Pharmac	2002	AIMS	To evaluate a group level policy
Impact of Oregon's priority list on Medicaid beneficiaries	Med Care Res Rev	2000	SF-12	To evaluate a group level policy
Impact of self-reported patient characteristics upon assessment of glycemic control in the Veterans Health Administration	Diabetes Care	2007	VR-36	To identify or stratify individual members
Impact of worksite wellness intervention on cardiac risk factors and one-year health care costs	Am J Card	2009	SF-36, KSQ	To evaluate a group level policy
Impaired physical performance predicts hospitalization risk for participants in the program of all-inclusive care for the elderly	Phys Ther	2019	ADL, PHQ-9	To identify or stratify individual members
Implementing an early intervention case management program in three medical groups	Case Manager	2003	ADL, IADL, SF-12, GDS	To evaluate a group level policy
Improved access and quality of care after enrollment in the New York State Children's Health Insurance Program (SCHIP)	Pediatrics	2004	SRH, Non-validated questionnaire(s)	To evaluate a group level policy; to evaluate quality of care
Improving risk adjustment for Medicare capitated reimbursement using nonlinear models	Med Care	2003	SRH, ADL, IADL	To identify or stratify individual members
Improving self-care for heart failure for seniors: the impact of video and written education and decision aids	Popul Health Manag	2012	SF-12	To evaluate a group level policy
Incentives for healthy behaviors: experience from Florida Medicaid's Enhanced Benefit Rewards program	J Prim Care Community Health	2013	SRH	To evaluate a group level policy
Integrated medical care for patients with serious psychiatric illness: a randomized trial	Arch Gen Psychiatry	2001	SF-36, SCL-90, ASI	To evaluate a group level policy
Integrating well-being information and the multidimensional adaptive prediction process to estimate individual-level future health care expenditure levels	Popul Health Manag	2016	Non-validated questionnaire(s)	To identify or stratify individual members
Interpreting the findings of the IMPROVE study	Am J Health Syst Pharm	2001	SF-36	To evaluate a group level policy
Lessons learned from employee fitness programs at the Marshfield Clinic	Wmj	2005	Non-validated questionnaire(s)	To evaluate a group level policy
Lowering employee health care costs through the Healthy Lifestyle Incentive Program	J Public Health Manag Pract	2011	SRH	To evaluate a group level policy
Maintaining physical activity among older adults: six-month outcomes of the Keep Active Minnesota randomized controlled trial	Prev Med	2008	SRH	To evaluate a group level policy
Making the right connection: matching patients to technology	Telemed J E Health	2003	SF-36	To evaluate a group level policy

Managed care organization and the quality of diabetes care: the Translating Research Into Action for Diabetes (TRIAD) study	Diabetes Care	2004	SRH	To evaluate quality of care
Managed care plans' requirements for screening for alcohol drug and mental health problems in primary care	Am J Manag Care	2002	Unspecified validated questionnaire(s)	To evaluate quality of care
Market and beneficiary characteristics associated with enrollment in Medicare managed care plans and fee-for-service	Med Care	2009	SRH	To evaluate a group level policy
Measuring frailty in Medicare data: development and validation of a claims-based frailty index	J Gerontol A Biol Sci Med Sci	2018	ADL, IADL, Non-validated questionnaire	To identify or stratify individual members
Measuring outcomes of type 2 diabetes disease management program in an HMO setting	South Med J	2002	SF-36	To evaluate a group level policy
Medicaid behavioral health care plan satisfaction and children's service utilization	Health Care Financ Rev	2004	SF-12, CHQ	To evaluate a group level policy
Medicaid beneficiaries in California reported less positive experiences when assigned to a managed care plan	Health Aff (Millwood)	2015	SRH, ADL, Non-validated questionnaire	To evaluate a group level policy
Medicaid expenditures on psychotropic medications for children in the child welfare system	J Child Adolesc Psychopharmacol	2012	SRH	To evaluate a group level policy
Medicaid managed care and the unmet need for mental health care among children with special health care needs	Health Serv Res	2008	Non-validated questionnaire(s)	To evaluate quality of care
Medicaid managed care: issues for enrollees with serious mental illness	Am J Manag Care	2019	SRH	Unspecified
Medicare beneficiaries and drug coverage	Health Aff (Millwood)	2000	SRH, ADL, IADL	To evaluate a group level policy
Medicare capitation model functional status and multiple comorbidities: model accuracy	Am J Manag Care	2008	ADL	Unspecified
Medicare health maintenance organizations and traditional coverage: perceptions of health care among beneficiaries with disabilities	Arch Phys Med Rehabil	2001	SRH, ADL, IADL	To evaluate a group level policy
Medicare Part D and changes in prescription drug use and cost burden: national estimates for the Medicare population 2000 to 2007	Med Care	2011	SRH	To evaluate a group level policy
Medicare Part D implementation and associated health impact among older adults in the united states	Int J Health Serv	2018	SRH, ADL, CES-D	To evaluate a group level policy
Medicare Part D roulette: potential implications of random assignment and plan restrictions	Medicare Medicaid Res Rev	2013	SRH	To evaluate a group level policy
Medicare subvention demonstration: greater access improved enrollee satisfaction but raised DOD Costs: GAO-02-68	GAO Reports	2001	SRH, SF-12	To evaluate a group level policy
Medication adherence and health care costs with the introduction of latanoprost therapy for glaucoma in a Medicare managed care population	Am J Geriatr Pharmacotherapy	2007	SF-12	To evaluate a group level policy; to identify or stratify individual members
Meeting the need for personal care among the elderly: does Medicaid home care spending matter?	Health Serv Res	2008	ADL	To evaluate a group level policy
Methods aimed at improving asthma care and outcomes management - a case study	Dis Manag Health Out	2002	SF-36	To evaluate a group level policy

Monitoring the health status and impact of treatment on Americans: the Medicare beneficiary health status registry	Med Care	1999	ADL, IADL, SF-36, MHI-5	To evaluate quality of care
No exit? The effect of health status on dissatisfaction and disenrollment from health plans	Health Serv Res	1999	PHI, GHP	To evaluate quality of care
Outcomes from DiabetesCARE: a pharmacist-provided diabetes management service	J Am Pharm Assoc (2003)	2008	SF-12	To evaluate a group level policy
Outcomes of a digital health program with human coaching for diabetes risk reduction in a Medicare population	J Aging Health	2018	PHQ-4, WHO-5	To evaluate a group level policy
Outcomes of managed care of dually eligible older persons	Gerontologist	2003	ADL, IADL, Unspecified validated questionnaire(s)	To evaluate a group level policy
Outcomes of preventive case management among high-risk elderly in three medical groups: a randomized clinical trial	Eval Health Prof	2004	SRH, ADL, IADL, SF-12	To evaluate a group level policy
Overcoming depression on the Internet (ODIN) (2): a randomized trial of a self-help depression skills program with reminders	J Med Internet Res	2005	SF-12, CES-D	To evaluate a group level policy
Patient satisfaction empowerment and health and disability status effects of a disease management-health promotion nurse intervention among Medicare beneficiaries with disabilities	Gerontologist	2009	ADL, IADL, SF-36, HLC	To evaluate a group level policy
Patient-centered outcomes of a value-based insurance design program for patients with diabetes	Popul Health Manag	2013	SRH	To evaluate a group level policy
Persistent medication affordability problems among disabled Medicare beneficiaries after Part D 2006-2011	Medical Care	2014	SRH	To evaluate a group level policy
Pharmacoeconomic evaluation of a pharmacist-managed hypertension clinic	Pharmacotherapy	2001	SF-36	To evaluate a group level policy
Plan-sponsor savings and member experience with point-of-service prescription step therapy	Am J Manag Care	2004	SRH	To evaluate a group level policy
Population-based medication reviews: a descriptive analysis of the medication issues identified in a Medicare not-for-profit prescription discount program	Ann Pharmac	2004	SRH	To evaluate a group level policy
Posthospitalization home health care use and changes in functional status in a Medicare population	Med Care	2000	SRH, ADL, IADL	To evaluate a group level policy
Potential effects of racial and ethnic disparities in meeting Medicare medication therapy management eligibility criteria	J Pharm Health Serv Res	2014	SRH, ADL, IADL	To evaluate a group level policy
Potential health implications of medication therapy management eligibility criteria in the patient protection and Affordable Care Act across racial and ethnic groups	J Manag Care Spec Pharm	2015	SRH, ADL, IADL	To evaluate a group level policy
Potential health implications of racial and ethnic disparities in meeting MTM eligibility criteria	Res Social Adm Pharm	2014	SRH, ADL, IADL	To evaluate a group level policy
Predicting 3-year mortality and admission to acute-care hospitals skilled nursing facilities and long-term care facilities in Medicare beneficiaries	Arch Gerontol Geriatr	2017	ADL, IADL	To identify or stratify individual members
Predicting healthcare costs in a population of veterans affairs beneficiaries using diagnosis-based risk adjustment and self-reported health status	Med Care	2004	VR-36	To identify or stratify individual members

Predicting high-cost privately insured patients based on self-reported health and utilization data	Am J Manag Care	2017	SRH	To identify or stratify individual members
Predicting patient-reported asthma outcomes for adults in managed care	Am J Manag Care	2004	SRH, Unspecified validated questionnaire(s)	To identify or stratify individual members
Predictive power of a risk-assessment questionnaire across different disease states: results in an elderly managed care enrolled population	Am J Manag Care	2001	ADL, IADL, SF-12, CES-D	To identify or stratify individual members
Predictors of satisfaction among adult recipients of Medicaid mental health services	Arch Psychiatr Nurs	2007	SRH, SF-12	To evaluate quality of care
Predictors of voluntary disenrollment from Medicare managed care	Med Care	2007	SF-36	Unspecified
Premorbid activity limitation stages are associated with posthospitalization discharge disposition	Am J Phys Med Rehabil	2018	ADL, IADL	To identify or stratify individual members
Prescription drug coverage and Medicare spending among U.S. elderly	Geneva Papers on Risk & Insurance - Issues & Practice	2010	SRH, ADL, IADL	To evaluate a group level policy
Preventing disability among working participants in Kansas' high-risk insurance pool: implications for health reform	J Vocat Rehab	2011	SF-12	To evaluate a group level policy
Preventive services among Medicare beneficiaries with supplemental coverage versus HMO enrollees Medicaid recipients and elders with no additional coverage	Med Care	2001	SRH, ADL, IADL	To evaluate a group level policy
Quality and cost evaluation of a medical financial assistance program	Perm J	2013	SRH	To evaluate a group level policy
Quality assessments by sick and healthy beneficiaries in traditional Medicare and Medicare managed care	Med Care	2009	SRH, Non-validated questionnaire	To evaluate quality of care
Quality improvement with pay-for-performance incentives in integrated behavioral health care	Am J Pub Health	2012	PHQ-9	To evaluate a group level policy
Quality of care and outcomes of adults with asthma treated by specialists and generalists in managed care	Arch Intern Med	2001	SF-36	To evaluate quality of care
Quality of care for primary care patients with depression in managed care	Arch Fam Med	1999	CIDI	To evaluate quality of care
Racial/ethnic disparities in access to Medicare home health care: the disparate impact of policy	J Gerontol Soc Work	2010	SRH, ADL, IADL	To evaluate a group level policy
Randomized controlled trial of a collaborative care intervention for mood disorders by a national commercial health plan	Psychiatr Serv	2019	PHQ-9, SF-12	To evaluate a group level policy
Randomized trial of two mind-body interventions for weight-loss maintenance	J Altern Complement Med	2007	CES-D	To evaluate a group level policy
Reach engagement and retention in an Internet-based weight loss program in a multi-site randomized controlled trial	J Med Internet Res	2007	Non-validated questionnaire	To evaluate a group level policy
Reduced unplanned care and disease activity and increased quality of life after patient enrollment in an inflammatory bowel disease medical home	Clin Gastroenterol Hepatol	2018	GAD-7, PHQ-9, SIBDQ, HBI, UCAI	To evaluate a group level policy

Reducing barriers to mental health care: bringing evidence-based psychotherapy home	J Am Geriatr Soc	2019	PHQ-9, Q-LES-Q, WHODAS, PAM, GAS	To evaluate a group level policy
Reductions in employee productivity impairment observed after implementation of web-based worksite health promotion programs	J Occup Environ Med	2011	CES-D, Non-validated questionnaire	To evaluate a group level policy
Referral management and the care of patients with diabetes: the Translating Research Into Action for Diabetes (TRIAD) study	Am J Manag Care	2004	SRH	To evaluate a group level policy
Relationships among performance measures for Medicare managed care plans	Health Care Financ Rev	2001	SRH	To evaluate quality of care
Restrictiveness of eligibility determination and Medicaid enrollment by low-income seniors	J Aging Soc Policy	2009	ADL, IADL	To evaluate a group level policy
Results of a randomized controlled trial of intervention to implement smoking guidelines in Veterans Affairs medical centers: increased use of medications without cessation benefit	Med Care	2004	SRH	To evaluate a group level policy
Risk adjustment for health plans disproportionately enrolling frail Medicare beneficiaries	Health Care Financ Rev	2000	ADL	To identify or stratify individual members
Risk adjustment for Medicare beneficiaries with Alzheimer's disease and related dementias	Am J Manag Care	2010	ADL	Unspecified
Risk classification of Medicare HMO enrollee cost levels using a decision-tree approach	Am J Manag Care	2004	SRH, ADL, IADL, SF-12, CES-D	To identify or stratify individual members
Risk-adjusted capitation rates for children: how useful are the survey-based measures?	Health Serv Res	2010	SRH	To evaluate a group level policy
Role of a psychiatric outcome study in a large scale quality improvement project	Eval Program Plan	1999	SF-36, SCL-90; GSI; STCPD; PDQ-R	To evaluate a group level policy
Rural-urban differences in Medicare quality outcomes and the impact of risk adjustment	Med Care	2017	SRH, ADL	To evaluate a group level policy
Satisfaction with hospital at home care	J Am Geriatr Soc	2006	SRH, ADL, IADL, GDS	To evaluate a group level policy
Screening for and diagnosis of depression among adolescents in a large health maintenance organization	Psychiatr Serv	2016	PHQ-9	To identify or stratify individual members
Screening for hospitalization and nutritional risks among community-dwelling older persons	Am J Clin Nutr	2001	SRH, ADL, IADL, Non-validated questionnaire	To identify or stratify individual members
Self-reported health and functional status information improves prediction of inpatient admissions and costs	Am J Manag Care	2011	SRH, IADL	To identify or stratify individual members
Service use and health status of persons with severe mental illness in full-risk and no-risk Medicaid programs	Psychiatr Serv	2002	SF-12	To evaluate a group level policy
Short-term impacts of coverage loss in a Medicaid population: early results from a prospective cohort study of the Oregon Health Plan	Ann Fam Med	2006	SRH	To evaluate a group level policy
Socioeconomic status and improvements in lifestyle coronary risk factors and quality of life: the Multisite Cardiac Lifestyle Intervention Program	Am J Public Health	2009	SF-36, CES-D	To evaluate a group level policy
State prescription drug policies cost barriers and the use of acute care services by Medicaid beneficiaries	J Consum Aff	2009	SRH	To evaluate a group level policy

Strategies for identifying and channeling patients for depression care management	Am J Manag Care	2008	PHQ-2, PHQ-9	To identify or stratify individual members
Strategies for Medicare health plans serving racial and ethnic minorities	Health Care Financ Rev	2002	SRH	To evaluate quality of care
Substance abuse treatment processes and outcomes in day/outpatient health maintenance organization setting	J Addict Nurs	2014	TOP	To evaluate a group level policy
Sumatriptan treatment for migraine in a health maintenance organization: economic humanistic and clinical outcomes	Clin Ther	1999	SF-36, MSQ	To evaluate a group level policy
Supporting caregivers of frail older adults in an HMO setting	Am J Orthopsychiatry	2004	SF-36, GHQ, SPS, MBBS, PPI	To evaluate a group level policy
Taking an evidence-based model of depression care from research to practice: making lemonade out of depression	Gen Hosp Psychiatry	2006	PHQ-9	To evaluate a group level policy
Targeting a high-risk group for fall prevention: strategies for health plans	Am J Manag Care	2015	Non-validated questionnaire	To identify or stratify individual members
Telephone screening outreach and care management for depressed workers and impact on clinical and work productivity outcomes: a randomized controlled trial	Jama	2007	QIDS, WHO, HPQ	To evaluate a group level policy
The acceptability and effectiveness of patient-reported assessments and feedback in a managed behavioral healthcare setting	Am J Manag Care	2005	SCL	To evaluate a group level policy
The aging brain care medical home: preliminary data	J Am Geriatr Soc	2015	PHQ-9, HABC-M	To evaluate a group level policy
The association between a tiered pharmacy benefit plan and medication usage health status and disability absence days--one employer's experience	J Occup Environ Med	2008	SRH, Non-validated questionnaire	To evaluate a group level policy
The community assessment risk screen (CARS): identifying elderly persons at risk for hospitalization or emergency department visit	Am J Manag Care	2000	HSQ, Non-validated questionnaire	To identify or stratify individual members
The effect of a disease management intervention on quality and outcomes of dementia care: a randomized controlled trial.	Ann Intern Med	2006	ADL, HUI3, EQ5D	To evaluate a group level policy
The effect of a randomized trial of home telemonitoring on medical costs 30-day readmissions mortality and health-related quality of life in a cohort of community-dwelling heart failure patients	J Card Fail	2014	SF-36, MLHF	To evaluate a group level policy
The effect of commercial insurance policies on outcomes of venous ablation	J Vasc Surg Venous Lymphat Disord	2018	NRS, Non-validated questionnaire	To evaluate a group level policy
The effect of emergency department copayments for Medicaid beneficiaries following the Deficit Reduction Act of 2005	JAMA Intern Med	2015	SRH	To evaluate a group level policy
The effect of new insurance coverage on the health status of low-income children in Santa Clara County	Health Serv Res	2007	SRH, Non-validated questionnaire	To evaluate a group level policy
The effect of weight loss on health productivity and medical expenditures among overweight employees	Med Care	2013	EQ5D	To evaluate a group level policy
The effectiveness of covering smoking cessation services for Medicare beneficiaries	Health Serv Res	2008	SRH	To evaluate a group level policy

The effects of a disease management program on self-reported health behaviors and health outcomes: evidence from the "Florida: a healthy state (FAHS)" Medicaid program	Health Educ Behav	2009	SF-12, Non-validated questionnaire	To evaluate a group level policy
The effects of state Medicaid expansions for working-age adults on senior Medicare beneficiaries	Am Econ J Econ Policy	2017	SRH, Unspecified validated questionnaire(s)	To evaluate a group level policy
The health and well-being of an ACO population	Am J Manag Care	2019	Non-validated questionnaire	To identify or stratify individual members
The impact of ancillary services on primary care use and outcomes for HIV/AIDS patients with public insurance coverage	AIDS Care	2002	SRH, ADL, Non-validated questionnaire	To evaluate a group level policy
The impact of disability and social determinants of health on condition-specific readmissions beyond Medicare	J Gen Intern Med	2017	ADL, Non-validated questionnaire	To identify or stratify individual members
The impact of Medicare Part D on cognitive functioning at older ages	Soc Sci Med	2017	CES-D	To evaluate a group level policy
The impact of Medicare Part D on out-of-pocket costs for prescription drugs medication utilization health resource utilization and preference-based health utility	Health Serv Res	2011	ADL, IADL, SF-6D	To evaluate a group level policy
The impact of telephonic health coaching on health outcomes in a high-risk population	Glob Adv Health Med	2013	PAM, Non-validated questionnaire	To evaluate a group level policy
The impact of the Affordable Care Act (ACA) on favorable risk selection and beneficiaries' health status in Medicare Advantage: a preliminary assessment	BMC Health Serv Res	2016	SRH, ADL, RAND-12	To evaluate a group level policy
The impact of the Iowa S-SCHIP program on access health status and the family environment	Ambul Pediatr	2003	SRH, Non-validated questionnaire	To evaluate a group level policy
The impact of worksite clinics on teacher health care utilization and cost self-reported health status and student academic achievement growth in a public school district	J Occup Environ Med	2018	SRH, Non-validated questionnaire	To evaluate a group level policy
The insurance effect on prescription drug expenditures among the elderly: findings from the 1997 Medical Expenditure Panel Survey	Med Care	2004	SRH, ADL, IADL	To evaluate a group level policy
The Oregon health insurance experiment: evidence from the first year	Q J Econ	2012	SRH, Healthy Days	To evaluate a group level policy
The performance of administrative and self-reported measures for risk adjustment of Veterans Affairs expenditures	Health Serv Res	2005	SF-36	To identify or stratify individual members
The power of reinsurance in health insurance exchanges to improve the fit of the payment system and reduce incentives for adverse selection	Inquiry	2013	SRH	To evaluate a group level policy
The return on investment of a Medicaid tobacco cessation program in Massachusetts	PLoS One	2012	SRH	To evaluate a group level policy
The steps to health employee weight management randomized control trial: rationale design and baseline characteristics	Contemp Clin Trials	2013	IWQL, Non-validated questionnaire	To evaluate a group level policy
The validity of claims-based risk estimation in underinsured populations	Am J Manag Care	2012	ADL, IADL, SF-12, WHOQOL-Brief, WHO-HPQs	To evaluate a group level policy
Time trends in medication use and expenditures in older patients with rheumatoid arthritis	Am J Med	2012	SRH, ADL	To evaluate a group level policy

Total knee arthroplasty outcomes in patients with Medicare Medicare Advantage and commercial insurance	J Knee Surg	2019	KOOS, PROMIS-29	To evaluate a group level policy
Trajectories of depressive symptoms among web-based health risk assessment participants	J Med Internet Res	2017	CES-D, PSS, WPAI	To identify or stratify individual members
Trends in the health status of Medicare risk contract enrollees	Health Care Financ Rev	2006	SRH, ADL, IADL	To identify or stratify individual members
Triptan therapy impacts health and productivity	J Occ Environ Med	2004	MSQ, HIT, PPMQ	To evaluate a group level policy
Two-year changes in health and functional status among elderly Medicare beneficiaries in HMOs and fee-for-service	Health Serv Res	2000	SRH, ADL, IADL, Non-validated questionnaire	To evaluate a group level policy
Two-year health and employment outcomes among injured workers enrolled in the Washington State Managed Care Pilot Project	Am J Ind Med	2001	SF-36, QOL, HAQ	To evaluate a group level policy
Understanding the gap between good processes of diabetes care and poor intermediate outcomes: Translating Research into Action for Diabetes (TRIAD)	Med Care	2007	SRH, EQ5D, PHQ-8, Non-validated questionnaire	To identify or stratify individual members
Understanding the socioeconomic and health challenges of the Medicaid expansion population in Oregon	Popul Health Manag	2019	SRH, Non-validated questionnaire	To evaluate a group level policy
Unmet long-term care needs: an analysis of Medicare-Medicaid dual eligibles	Inquiry	2005	SRH, ADL	To evaluate a group level policy
Urban-rural differences in the effect of a Medicare health promotion and disease self-management program on physical function and health care expenditures	Gerontologist	2009	SRH, ADL, IADL	To evaluate a group level policy
Use of the short form 36 in a primary care based disease management program for patients with congestive heart failure	Dis Manag	2003	SF-36	To evaluate a group level policy
Using health-related quality of life assessments to evaluate care support within Medicaid	Care Manag J	2008	HUI3	To evaluate a group level policy
Using self-reported data to segment older adult populations with complex care needs	EGEMS (Wash DC)	2019	SRH, ADL, GAD-2, IADL, PHQ-2, Non-validated questionnaire	To identify or stratify individual members
Using sequential e-mail messages to promote health behaviors: evidence of feasibility and reach in a worksite sample.	J Med Internet Res	2006	SF-12, IPAQ	To evaluate a group level policy
Validating a method to assess disease burden from insurance claims	Am J Manag Care	2019	SRH, Non-validated questionnaire	Unspecified
VA-Medicare dual beneficiaries' enrollment in Medicare HMOs: access to VA availability of HMOs and favorable selection	Med Care Res Rev	2005	VR-36	To evaluate a group level policy
Variations in risk-adjusted outcomes in a managed acute/long-term care program for frail elderly individuals	Int J Qual Health Care	2004	SRH, ADL, IADL	To evaluate quality of care
Well-being health and productivity improvement after an employee well-being intervention in large retail distribution centers	J Occup Environ Med	2014	IWBS	To evaluate a group level policy
What does Medicaid expansion mean for cancer screening and prevention? Results from a randomized trial on the impacts of acquiring Medicaid coverage	Cancer	2016	SRH	To evaluate a group level policy

What factors influence seniors' desire for choice among health insurance options? Survey results on the Medicare prescription drug benefit	Health Econ Policy Law	2010	SRH	To evaluate a group level policy
Who bears the burden of Medicaid drug copayment policies?	Health Aff (Millwood)	1999	SRH, ADL, IADL	To evaluate a group level policy
Review Articles				
Is it time for a patient-centered quality measure of asthma control?	J Allergy Clin Immunol Pract	2019	ACT, cACT, ATAQ, ACQ, TRACK, AMR, MMA	To evaluate quality of care
Feasibility and value of patient-reported outcome measures for value-based payment	Med Care	2019	VR-12, PROMIS-29	Unspecified
How financial and reputational incentives can be used to improve medical care	Health Serv Res	2015	Unspecified validated questionnaire(s)	To evaluate a group level policy
Lessons learned from bundled payment programs	Instr Course Lect	2018	KOOS, VR-12, PROMIS Global, Unspecified validated questionnaire	To evaluate a group level policy
The evidence supporting treatment of reflux and obstruction in chronic venous disease	J Vasc Surg Venous Lymphat Disord	2017	SF-36, VEINES-QOL, Unspecified validated questionnaire	To evaluate a group level policy
Treatment-resistant depression: managed care considerations	J Manag Care Pharm	2007	MADRS, HAM-D	Unspecified
Using patient-reported information to improve clinical practice	Health Serv Res	2015	Unspecified validated questionnaire(s)	To evaluate a group level policy
White Papers				
Post-Traumatic Stress Disorder: DOD needs to identify the factors its providers use to make mental health evaluation referrals for servicemembers: GAO-06-397	GAO Reports	2006	Unspecified validated questionnaire(s)	To evaluate quality of care

PROS Used Abbreviations

24-Hr-MQOLQ: 24-Hour Migraine Quality of Life Questionnaire

ACT: Asthma Control Test

ADL: Activities of Daily Living

AIMS: Arthritis Impact Measurement Scales

ASMIS: Asthma Impact Score

ATHIS: Athens Insomnia Scale

AMR: Asthma Medication Ration

AQAS: Asthma Quality Assessment System

AQLQ: Mini-Asthma Quality of Life Questionnaire

ATAQ: Asthma Therapy Assessment Questionnaire

BAI: Beck Anxiety Inventory

BASIS-32: Behavior and Symptom Identification Scale

BDDs: Bed Disability Days

BPI: Brief Pain Inventory

BSQ: Body Shape Questionnaire

cACT: Childhood Asthma Control Test

CARE-Short: Comprehensive Assessment and Referral Evaluation

CBCL: Child Behavior Checklist

CBS: Caregiver Burden Scale

CES-D: Center for Epidemiologic Studies Depression Scale

CHART-SF: The Craig Handicap Assessment and Reporting Technique-Short Form
CHQ and *CHQ-PF50: Child Health Questionnaire*
CIDI: Composite International Diagnostic Interview
CIS: Columbia Impairment Scale
COPE: Coping Orientation to Problems Experienced
DSES: Diabetes Self-Efficacy Scale
EQ5D: EuroQol Five-Dimension Scale
FQ: Fear Questionnaire
GADS: Goldberg Anxiety and Depression Scale
GAS: Global Anxiety Scale
GDS: Geriatric Depression Scale
GHP: PROMIS Global Physical Health
GHQ-12: General Health Questionnaire
GNDS: Guy's Neurological Disability Scale
GSE: General Self-Efficacy Scale
GSI: Global Severity Index
HABC-M: Healthy Aging Brain Care Monitor
HAQ: Health Assessment Questionnaire
HBI: Harvey Bradshaw Index
HDI: Headache Disability Index
HDRS, aka HAM-D: Hamilton Rating Scale for Depression
HHS: Harris Hip Score
HImQ: The Headache Impact Questionnaire
HIT: Headache Impact Test
HLC: Health Locus of Control
HOOS, JR: Hip Disability and Osteoarthritis Outcome Score, Joint Replacement
HOOS: Hip disability and Osteoarthritis Outcome Score
HOOS-PS: Hip disability and Osteoarthritis Outcome Score-Physical Function Short-form
HUI: Health Utilities Index
IADL: Instrumental Activities of Daily Living
ICH CAHPS: In-Center Hemodialysis Consumer Assessment of Healthcare Providers and Systems
IPAQ: International Physical Activity Questionnaire
ISI: Insomnia Severity Index
IWBS: Individual Well-Being Scores (Gallup-Healthways)
KDQOL-36: Kidney Disease Quality of Life
KOOS, JR: Knee Injury and Osteoarthritis Outcome Score for Joint Replacement
KOOS: Knee Injury and Osteoarthritis Outcome Score
KOOS-PS: Knee Injury and Osteoarthritis Outcome Score Short Form
KSQ: Kellner Symptom Questionnaire
KSS: Knee Society Score
LSNS: Lubben Social Network Scale
LSP: Life Skills Profile
MADRS: Montgomery-Asberg Depression Rating
MBBS: Montgomery-Borgatta Burden Scale
MBPC: Memory and Behavior Problem Checklist
MC-QWB: Quality of Well-Being Score
MHI-5: Mental Health Inventory
MHLC: Multidimensional Health Locus of Control Scale
MIDAS: Migraine Disability Assessment
Migraine ACT: Migraine Assessment of Current Therapy
mJOA: Modified Japanese Orthopaedic Association score
MLHF: Minnesota Living with Heart Failure Questionnaire
MMA: Management of People with Asthma
MSCL: Medical Symptoms Checklist
MSIS-29: Multiple Sclerosis Impact Scale

MSQOL: Migraine Specific Quality of Life
MTAQ: Migraine Therapy Assessment Questionnaire
NASS Lumbar: North American Spine Society Low Back Outcome Instrument
NDI: Neck Disability Index
ODI: Oswestry Disability Index
OHS: Oxford Hip Score
OKS: Oxford Knee Score
OMFAQ: OARS Multidimensional Functional Assessment
OQ-30: Outcome Questionnaire-30, aka Life Status Questionnaire (LSQ)
OQ-45: Outcome Questionnaire
PACQLQ: Pediatric Asthma Caregiver Quality of Life
PAM: Patient Activation Measure
PDDS: Patient Determined Disease Steps
PDQ-R: Personality Disorder Questionnaire: Revised
PDSS: Panic Disorder Severity Scale
PHI: Personal Health Inventory
PHQ-2, -4, -9: Patient Health Questionnaire
PPI: Pressing Problems Index
PPMQ: Patient Perception of Migraine Questionnaire
PROMIS Global Health: Patient Reported Outcomes Measurement Information System Global Health
PROMIS-29: Patient Reported Outcomes Measurement Information System Profile-29
PSQI : Pittsburgh Sleep Quality Index
PSS: Perceived Stress Scale
QIDS: Quick Inventory of Depressive Symptomatology
QIDS-SR: Quick Inventory of Depressive Symptomatology-Self Report
QOL: Quality of Life
QOLIE: Quality of Life in Epilepsy
QWB: Quality of Wellbeing Scale
RADs: Restricted Activity Days
RDS: Rose Dyspnea Scale
SAQ-7: Seattle Angina Questionnaire
SCI: Stress and Coping Inventory
SCL-20: Hopkins Symptom Checklist Depression Scale
SCL-90-R: Symptom Checklist-90-Revised
SDS: Sheehan Disability Scale
SEMCD: Self-Efficacy for Managing Chronic Disease
SF-36: Short Form Health Survey
SF-LSI: Life Satisfaction Index
SFMPQ: Short Form McGill Pain Questionnaire
SIBDQ: Short Inflammatory Bowel Disease Questionnaire
SIP-AB: Alertness Behavior
SIP-PFD: Sickness Impact Profile: Physical Functioning Dimension
SLAQ: Systemic Lupus Activity Questionnaire
SRH: Self-Rated Health
SSEBQ: Social Support for Exercise Behavior Questionnaire
STAI: The State-Trait Anxiety Inventory
STCPD: Screening Test for Co-Morbid Personality Disorders
SWLS: Satisfaction with Life Scale
TCQ: Treatment Credibility
TRACK: Test for Respiratory and Asthma Control in Kids
VEINES-QOL: Venous Insufficiency Epidemiological and Economic Study
VR-12, -36: Veterans 12 and 36
WHO-5: World Health Organization Global Health Index
WHODAS: World Health Organization Disability Assessment Scale
WHO-HPQs: World Health Organization Health and Work Performance Questionnaires

WHOQOL: World Health Organization Quality of Life Questionnaire

WLQ: Work Limitations Questionnaire

WOMAC: Western Ontario and McMaster Universities Arthritis Index

WPAI: Work Productivity and Activity Impairment Questionnaire

ZBI: Zarit Burden Interview

Table 1a: Summary Statistics of the 350 Included Articles

	Number of Articles	Percent of Articles
Type of Study		
Quantitative	299	85.4%
Commentary	21	6.0%
Mixed-Methods	8	2.3%
Protocol	9	2.6%
Review	7	2.0%
Other	4	1.1%
Qualitative	1	0.3%
White Paper	1	0.3%
Year of First Data Included		
N/A	40	11.4%
1988-1995	37	10.6%
1996-2000	95	27.1%
2001-2005	77	22.0%
2006-2010	47	13.4%
2011-2015	36	10.3%
2015-2019	18	5.1%
Data Source(s)		
Collected for Research Project	172	49.1%
Collected by Insurer	103	29.4%
Collected by Provider	34	9.7%
Collected by Employer	13	3.7%
Other	38	10.9%
Article Purpose(s)		
Evaluate policy, intervention, or strategy	255	72.9%
Identify or stratify population	48	13.7%
Evaluate quality of care	41	11.7%
Other	19	5.4%
Outcome(s) of Interest		
HRQoL PRO	198	56.6%
Healthcare Utilization	139	39.7%
Healthcare Cost	107	30.6%
Healthcare Quality	91	26.0%
Health Status	84	24.0%
Other	114	32.6%
Insurance Type(s)		
Medicare FFS	101	28.9%
Medicare Advantage	88	25.1%
Medicaid	65	18.6%

Employer-sponsored insurance	59	16.9%
Medicare Special Needs Plan (SNP)	16	4.6%
VA	26	7.4%
Commercial	23	6.6%
CHIP	5	1.4%
Other		0.0%
Unspecified type	60	17.1%
Behavioral health insurance	2	0.6%
Other government-sponsored insurance product	2	0.6%
Prescription drug insurance	3	0.9%
Supplemental insurance*	1	0.3%
IDFS Status		
Insurer was part of an IDFS	69	19.7%
Age Group(s) Addressed		
0-17	36	10.3%
18-64	234	66.9%
65 and over	262	74.9%
Used a control or comparison group		
Yes	190	54.3%
*This insurance type is represented because the study population was a mix of various insurance types.		