The impacts of accountable care organizations on patient experience, health outcomes and costs: a rapid review

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Abstract

Objectives: Accountable care organizations were implemented as a system-level approach to address quality differences and curb increasing healthcare costs in the United States of America, and have garnered the interest of policy makers in other countries to support better management of patients. The objectives of this paper are to: (1) identify the impacts of accountable care organizations on improving the quadruple aim goals of improving patient experience of care, enhancing population health outcomes, reducing the per capita cost of health care and ensuring positive provider experiences and (2) determine how and why such impacts have been achieved through accountable care organizations.

Methods: We used a rapid review approach, searching Health Systems Evidence (for systematic reviews) and PubMed (for reviews and studies). Results were reviewed for inclusion independently by two researchers. Data were extracted by one reviewer and checked for consistency by another.

Results: We identified one recent systematic review and 59 primary studies that addressed the first objective (n = 54), the second objective (n = 4) or both objectives (n = 1). The reviewed studies suggest that accountable care organizations reduce costs without reducing quality. Key findings related to objective 1 include: (1) there are positive trends across the quadruple-aim outcomes for accountable care organizations as compared to Medicare fee-for-service or group physician fee-for-service models; (2) accountable care organizations produced modest cost savings, which are largely attributable to savings in outpatient expenses among the most medically complex patients and reductions in the delivery of low-value services; (3) accountable care organization models met the majority of quality measures and perform better than their fee-for-service counterparts and (4) there is relatively little evidence about the impact of accountable care organizations on provider experience. Qualitative studies related to objective 2 highlighted mechanisms that were important for enabling accountable care organizations, including supplemental staff to enhance coordination and accountable care organization-wide electronic health records.

Conclusions: General trends and increased adoption of models similar to accountable care organizations outside of the USA suggest that these models outperform traditional fee-for-service models across the quadruple aim goals, although with mixed evidence about health outcomes.

Keywords
accountable care organizations, health reform, United States of America

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Background

Introduction

Accountable care organizations (ACOs) are groups of physicians, hospitals and other healthcare providers who voluntarily come together to assume collective responsibility for the care of a specific population. In assuming this responsibility, providers share in any savings or in any potential costs when service delivery and cost are compared to historical benchmarks.

While various models have been operating for some time, ACOs were formally implemented in the US as part of changes made to the Patient Protection and Affordable Care Act in 2012. They have the goal of achieving the ‘Quadruple Aim’ of: (1) improving the patient experience of care, (2) improving population health, (3) reducing the per capita costs of health care and (4) ensuring positive provider experiences. To achieve these outcomes, ACOs must create a network of providers (primary-care physicians, specialists, hospitals etc.) to serve a specific patient population; define the population for which the ACO is willing and able to assume risk; ensure the appropriate quality and amount of care is being delivered to those populations and eliminate wasteful expenditure.

The ACO model emerged from efforts by both for-profit and not-for-profit insurance companies and Medicare and Medicaid Services to address quality differences and curb increasing healthcare costs. To do so, ACOs are held ‘accountable’ to patients and payers through a pay-for-performance model whereby providers share in the overall savings which are linked, in full or in part, to achieving population-based performance standards on quality measures and to reporting reductions in per member, per month costs. This payment model reorients incentives to encourage providers to focus on the total cost of patient care instead of per service payments to provide an incentive for providers to prevent illness. ACOs, however, must ensure that these cost savings are not achieved at the expense of patient care or population health outcomes.

The ACO model has garnered interest among policy-makers in other countries, including England and Canada, to support better management of patients, particularly those with complex needs. Policy makers in Ontario, Canada requested this review to inform the province’s ongoing development and implementation of its approach to enhancing the delivery of coordinated care in the community. Our specific objectives were to: (1) identify the impacts of ACOs on improving the quadruple aim goals of improving patient experience of care, enhancing population health outcomes, reducing the per capita cost of health care and ensuring positive provider experiences and (2) determine how and why such impacts have been achieved through ACOs.

Methods

Search strategy

We used a rapid review approach, which refers to a streamlined systematic review within a compressed timeline (e.g. to meet policy makers’ needs to inform policy development in a timely way). This includes streamlined efforts to identify, organize/map and synthesize findings. Our searches therefore focused on identifying potentially relevant systematic reviews and economic evaluations from Health Systems Evidence (www.healthsystemsevidence.org, a repository of systematic reviews addressing health-system topics) and primary studies using a targeted search of PubMed (both were searched from inception to June 2019). In Health Systems Evidence, we searched for ‘accountable care organization’ OR ‘accountable care organisations’ OR ‘accountable care organisation’ OR ‘accountable care organisations’ using the open search. In PubMed, we conducted an open search using the same combination of terms using the ‘health services research’ topic filter for outcomes assessment. We also conducted ‘related articles’ searches in PubMed using two relevant background articles that we identified from preliminary searches of the literature.

Grey literature was identified by hand searching the CMS (www.cms.gov) and Medicare (www.medicare.gov) websites and reviewing relevant references from include studies. In addition, two merit reviewers (both of which are from the USA and have extensive knowledge of ACO models) and one of our co-authors who is conversant with the health-policy landscape in the USA provided additional suggestions for relevant literature. Finally, another systematic review has been published since our searches were conducted, which we have also included. We assessed the methodological quality of this systematic review using the AMSTAR tool.

Given that our review was a rapid review of the evidence, we did not conduct quality appraisals of single studies.

The results from the searches were independently assessed for inclusion by two reviewers according to whether the included findings were relevant to our two objectives. One of the authors conducted data extraction, which was checked for consistency by two other authors. For the included studies, we extracted the focus, methods used, description of the sample, jurisdiction(s) studied, key features of the intervention and key findings related to the questions of our review.
Results

The studies on which this review is based are listed in Online Supplement 1. We identified one recent systematic review by Kaufman et al., which we appraised as being of medium methodological quality (7/10 on the AMSTAR criteria), as well as 59 primary studies that evaluated the outcomes of implementing a private or public ACO model compared to traditional fee-for-service payment models, or how ACO goals were achieved. The systematic review by Kaufman et al. focused on assessing the association of public and private ACOs with health service use, processes and outcomes of care. It is therefore most relevant to two of the three outcomes included in our first question about the impacts of ACOs – patient experiences and population health outcomes – but not to the costs part of our first objective. However, the review is mostly focused on utilization and process measures, which was not the focus of our study, and it does not include relevant information for our second question about how and why any impacts have been achieved. In comparing studies included in the Kaufman et al review to those in ours, it was therefore not surprising that: (1) we included seven studies not included in their review; (2) both reviews overlapped in the inclusion of 21 studies and (3) their review included 25 studies that we did not identify, given its focus on utilization and process outcomes.

Of the 59 included studies, 54 provide insights into whether ACOs meet the quadruple aim (question 1), while four primary studies identified the ways an ACO model has improved the quality of care across a dozen settings and how ACOs help primary-care physicians deliver high-quality care (question 2), and one addressed both.

Ten of the included studies were conducted in single states with six in Massachusetts, one in Florida one in Minnesota, one in Michigan and one in Ohio (Online Supplement 1 references 1,5,8,10,11,14,17,21,29,54). Six studies used comparative data from multiple states, with one using data from two states (Illinois and California), two using data from three states (Arizona, New Hampshire and Texas; and Maine, Vermont and Minnesota respectively), one from four states (Ohio, Illinois, Colorado, Missouri), one from six states (New Jersey, Oregon, Colorado, New Mexico, New York) and one from 17 states (Online Supplement 1 references 18,27,31,34,37,48). Finally, the remaining 43 studies used national comparative data (Online Supplement 1 references 2-4,6,7,9,12,16,19,20,22-26,28,30,32,33,35,36,38-47,49-53,55,56,58).

The majority of studies (n = 41) used Medicare and Medicaid claims data to statistically compare service utilization and spending between ACOs and traditional fee-for-service payment models (Online Supplement 1 references 1,2,4,7,9,16,19,20,23,25,26,28,30,35,37,39,43,47,49-47,49,53,55,56,58).

The 59 included studies focused on five Centers for Medicaid and Medicare-affiliated (CMS) ACO programmes (Physician Group Practice (PGP), Medicare Shared Savings Program (MSSP), Advance Payment ACO Model and the Pioneer ACO Model) and the Blue Cross & Blue Shield ‘Alternative Quality Contract’ (AQC), and other private ACOs (see the table in Online Supplement 2 for a summary of the initiator and time period for specific ACOs). While all ACOs collect and report on various aspects of the care they provide, only ACOs participating in CMS ACO programmes (i.e. those with public-payer contracts, including PGP, MSSP, Advance Payment and Pioneer) are required to collect data and publicly report on 34 nationally recognized quality measures that span the four quality domains of: (1) patient/caregiver experience; (2) care coordination and patient safety; (3) preventive health and (4) clinical care for at-risk populations (a full list of the quality measures is provided in our original rapid synthesis report). Given the lack of publicly available data for some ACOs, the amount of publicly available comparative data on ACO models and cost-effectiveness is limited (Online Supplement 1 reference 59).

Impacts of ACOs

The impacts of the five models of ACOs included in this review on patient experience of care, population health, and per capita cost of health care are summarized in the table in Online Supplement 3. It should be noted that no studies were found that evaluated the quadruple aim in advance payment models on their own, but this model was included in studies that evaluated multiple types of ACOs (Online Supplement 1 references 1,3,5,14,15,20).

Impacts of ACOs on patient experience of care. Patient experience of care was assessed in 33 of the 60 studies reviewed using patient satisfaction surveys, semi-structured interviews, patient and family engagement measures and clinical quality measures (Online Supplement 1 references 1,3,5,7,9,11,14-18,20,23-25,30-32,34-36,40-45,51,55-57,60).

Seven studies examined patient satisfaction and patient and family engagement within ACOs (Online Supplement 1 references 2,3,7,17,36,40,42). Overall, results examining patient satisfaction found similar ratings between ACOs and fee-for-service models, although self-reported timely access to care was found to be higher in ACO models in one study (Online Supplement 3 reference 2) and satisfaction
with clinician communication were found to be somewhat higher among some ACO models in two studies (Online Supplement 1 references 2,36). Studies examining patient engagement found that the majority of physicians in ACOs implemented some form of patient engagement but it was found that more emphasis was needed on shared decision-making, co-development of care plans and engagement in governance and quality improvement activities.(included study 3). However, physician organizations that participated in ACOs were found to be more likely to have care-transition management practices in place, including communication between primary-care physicians and hospitals around patient admissions and discharge plans (Online Supplement 1 reference 41).

Mixed evidence was found regarding the extent to which ACOs improve quality of care. Five studies found improvements in each the PGP, AQC, MSSP and Pioneer models on a number of indicators compared to fee-for-service models (Online Supplement 1 references 5,11,16,18,20). These include increases in quality measures for chronic disease such as COPD, diabetes mellitus and congestive heart failure; increases in the percentage of enrollees that meet chronic-care management and paediatric-care thresholds and reductions in hospital admissions related to key prevention indicators (Online Supplement 1 references 11,16,20). Five additional studies found small improvements in quality of patient care (Online Supplement 1 references 1,7,9,15,17), while one found mixed outcomes with improvements in some quality indicators and no change in others (Online Supplement 1 reference 34) and one found no difference in quality indicators for mental health specifically (Online Supplement 1 reference 31). ACOs were associated with more appropriate breast and colorectal screening but mixed results were found for prostate cancer screening (Online Supplement 1 references 51,55,56). Appropriateness of treatment also improved in ACOs relative to non-ACOs in some domains including end-of-life stroke care and prostate cancer (Online Supplement 1 references 32,43) but findings were mixed for prescribing and end-of-life cancer care (Online Supplement 1 references 31,33,44,60). (ACO-attributed patients and ACO-participating hospitals were found to have similar rates of hospital readmission compared to fee-for-service patients and services across a range of conditions including stroke, pneumonia, heart failure and all-cause admissions (Online Supplement 1 references 34,35,45,57), with conflicting findings for readmission rates for acute myocardial infarction (Online Supplement 1 references 45,47). Studies reported that PGP's did not limit the use of discretionary imaging or revascularization services and found that commercial ACOs were not associated with consistent improvements in cardiovascular disease, diabetes-related measures or re-admissions in year 1. Despite finding no improvements in year 1 (Online Supplement 1 references 1,9), one study found significant improvements in Low-density lipoprotein (LDL) cholesterol testing and diabetes-related measures in year 2 (Online Supplement 1 reference 1).

Four studies compared quality of care across ACOs (Online Supplement 1 references 23-25,36). One of these found no significant difference in the quality of mental health care across three quality measures (relating to spending and utilization of emergency services) provided by MSSP or Pioneer ACOs (Online Supplement 1 reference 23). Another study found that as compared to low-performing ACOs, high-performing ACOs had formed collaborative relationships with local hospitals enabling improved coordination through the receipt of timely information about admissions and discharge of patients (Online Supplement 1 reference 24). Pioneer ACO hospitals that had higher quality prior to ACO implementation were associated with greater improvements in patient experience, while Pioneer hospitals with low baseline scores and MSSP hospitals did not differ from non-ACO hospitals in terms of changes on patient experience scores (Online Supplement 1 reference 36). The fourth study found that ACOs that serve a high proportion of minority patients performed worse than other ACOs on quality performance measures, and these associations were not entirely explained by patient characteristics (e.g. higher risk, greater severity of illness) (Online Supplement 1 reference 25).

**Impacts of ACOs on population health.** The systematic review we identified included six studies that evaluated health-related outcomes related to ACOs (Online Supplement 1 references 13,14,19,50,60,61), although only two of these studies had sufficient data to fully address population health outcomes (Online Supplement 1 references 13,19). Of these, the first study found a significant reduction in mortality among cancer patients at a PGP site (Online Supplement 1 reference 13). The second study found that hospitals that became more centralized through an ACO had significantly larger reductions in mortality compared to those that remained free standing (Online Supplement 1 reference 14). This study warned, however, that very tightly integrated physician–hospital linkages were found to increase mortality (Online Supplement 1 reference 14). The other four studies identified in the systematic review found no significant impact on mortality in the early years of the MSSP and advance payment models, and no association between MSSP and a range of short-term clinical outcomes (e.g. 30-day mortality, inpatient mortality and surgical
Impacts of ACOs on per capita cost of care. Thirty primary studies assessed cost savings related to ACO implementation as compared to traditional fee-for-service compensation models (Online Supplement 1 references 1-6,8,9,11-13,16,18,20,23,26,28,31,32,37-40,46,47,52-54,58,60). ACOs were associated with either per capita cost savings or with spending increases that were less than increases in traditional models in 20 studies. Six studies did not find statistically significant cost savings from an AQC or MSSP models (Online Supplement 1 references 18,26,32,46,47,52), one found higher per-visit costs for Rural Health Clinics in the first two years of ACO implementation (Online Supplement 1 reference 38), and one focusing solely on prostate cancer found higher costs of care for this condition (Online Supplement 1 reference 39).

Studies examining cost savings in PGP sites found relatively modest savings of about 2.0% per beneficiary per year during the five-year demonstration period (Online Supplement 1 references 12,16). AQCs were also associated with generally modest savings, with one achieving increased savings of $34 per beneficiary in year 1 to $51 in year 2. From these combined savings, $73 per beneficiary can be attributed to a reduction in outpatient care, which included savings in office visits, emergency department visits, minor procedures, imaging and laboratory tests (Online Supplement 1 reference 1). Other studies found more significant savings, in the range of $15.51–$62.21 per enrollee per quarter. Savings were concentrated in outpatient facility settings, which were attributable to a reduction of 4.0% in professional spending, 19.3% in facility spending, 8.7% in procedures, 10.9% for imaging and 9.7% in tests (Online Supplement 1 reference 8). Two studies reporting on cost savings in MSSPs found that estimated savings among independent primary-care groups attached to MSSPs were significantly higher than savings in hospital-integrated primary-care groups (Online Supplement 1 references 26,49). However, one of these studies found no significant change for the differential spending per beneficiary of those enrolled in MSSP when compared to fee-for-service models (Online Supplement 1 reference 26), while the other found that MSSP ACOs implemented in 2012 had a cost reduction of $302 per beneficiary by 2015 (Online Supplement 1 reference 49). MSSP ACOs were not associated with changes in post-acute care spending (Online Supplement 1 reference 39) and Pioneer ACOs were associated with a 4.5% total reduction in spending on low-value services (Online Supplement 1 reference 6). One study reported a reduction of $384 million for the ACO group in its first year of service, while another study reported increases in spending but at a slower rate than its fee-for-service comparison (Online Supplement 1 references 2,20). Another study found that MSSP and Pioneer models were associated with a significant savings of $345 per beneficiary in Part A (hospital insurance) and Part B (medical insurance) of Medicare spending compared to control groups (Online Supplement 1 reference 28). However, no difference was found across MSSP, Pioneer, or control fee-for-service enrollees in Part D Medicare spending for total prescriptions filled or percent of claims submitted for brand-name drugs (Online Supplement 1 reference 28). Lastly, a 10-year simulation study predicted that over a decade, high- and medium-quality Pioneer and MSSP ACOs would see cost savings of $456 and $857 per beneficiary respectively compared to benchmark expenses, while low-quality ACOs would face per-beneficiary losses of $41 and $107, respectively (Online Supplement 1 reference 39).

Thirteen studies assessed differential cost savings for some ACOs for specific populations or groups (Online Supplement 1 references 1,9,12,23,31,32,35,37,39,40,47,54,58). A PGP site reported higher savings attributed to dually eligible (Medicare and Medicaid) beneficiaries ($532 annually per beneficiary), who tend to be medically complex and socially vulnerable compared to their non-dually eligible beneficiaries ($59 annually per beneficiary) (Online Supplement 1 reference 12). Ten PGP sites achieved a 3.9% reduction in payments per cancer patient across participating sites, and these savings reflected a reduction in either utilization or price of services (Online Supplement 1 reference 13). However, three studies found that costs of cancer care did not differ between ACOs and fee-for-service providers (Online Supplement 1 references 32,46,47). An additional study found that costs of care for newly diagnosed prostate cancer patients in ACOs were significantly higher, costing $20,916 per beneficiary in the first year of treatment compared to $19,773 in non-ACO practices (Online Supplement 1 references 39). In another disease-specific study, cardiovascular spending did not differ between ACO and non-ACO beneficiaries in the first ninety days following cardiovascular admission, but spending was reduced between 90 days and one year from admission which was achieved primarily by reduced readmissions relative
to non-ACO beneficiaries (Online Supplement 1 reference 58). Other studies found no difference or marginal differences between ACO and non-ACO condition-specific spending for a range of conditions (Online Supplement 1 references 35, 54). One study found that costs for paediatric care at an ACO grew much more slowly compared to Medicaid fee-for-service or managed care plans (Online Supplement 1 reference 1). Medicaid-enrolled mothers in states with Medicaid ACOs also had lower average costs per birth than those in states without Medicaid ACOs (Online Supplement 1 reference 1). This reduction was driven primarily by savings in one of the three states studied, while costs rose in a second state. Two studies found reduced costs for mental health care or for beneficiaries with mental health diagnoses. The first reported a reduction of $170 per beneficiary enrolled in an MSSP ACO for the delivery of mental health conditions, with the reduction in spending largely a result of a reduction in inpatient spending on hospital admissions for mental health conditions (supplement reference 23). The second found that expenditures for beneficiaries with mental health diagnoses increased less rapidly in ACOs than non-ACOs in two of three included states (Online Supplement 1 reference 31). The second also found that expenditures for beneficiaries with mental health diagnoses increased less rapidly in ACOs than non-ACOs in two of three included states. Finally, for non-elderly Americans, ACO attribution was not associated with differences in expenditure (Online Supplement 1 reference 40).

Finally, one study reported the reward on investment from patient engagement and activation activities across ACOs and found ratios of between 2:1 or 4:1 for all investments in patient engagement, which were primarily based on reductions in emergency room visits and hospitalizations (Online Supplement 1 reference 3).

**Impacts of ACOs on provider experience.** Five primary studies included findings related to maintaining positive provider experiences, but it was not the primary outcome of any of the studies included and findings were mixed. Three of the studies focused on collaboration and coordination (Online Supplement 1 references 3, 24, 31), however only two reported on outcomes. The two studies found that collaboration between health professionals, which in some cases was eased through co-location or through care coordinators, eased the process of coordinating patient care and helped to address barriers to quality care including lack of provider time (Online Supplement 1 references 3, 31). The fourth study found that primary-care providers expressed that quality targets hinder their focus on patient needs, while pay-for-performance unfairly penalized providers for their patients’ choices (Online Supplement 1 study 17). Finally, the last study related only somewhat to provider experience, finding that higher scores for teamwork were not associated with improved patient-reported outcomes (Online Supplement 1 reference 27).

**How and why the impacts of ACOs have been achieved**

We found three qualitative studies, one quantitative survey, and one mixed-methods study relevant to how and why the impacts of ACOs have been achieved. One of the two studies focused on an AQC that incentivized ACOs to meet new paediatric care standards (Online Supplement 1 reference 21). Following the implementation of a paediatric performance-based compensation structure, leaders from 12 of the ACOs involved in the implementation participated in interviews where they reported improvements in the quality of their paediatric care efforts in the form of new practices, metrics and related monitoring (e.g. some started holding meetings to discuss paediatric quality improvement). ACO leaders however, reported that the AQC did little to incentivize the development of paediatric care or the improvement in care for children with specialized needs. The study further indicated that ACO leaders reported that while they implemented attempts to monitor and reduce paediatric spending patterns to align with the incentives offered through the AQC, their attempts did not necessarily change patients’ utilization patterns.

The second study involved interviews with primary-care physicians, administrators executives and who were early adopters of the ACO model. Respondents highlighted mechanisms that enabled the delivery of high-quality primary care, including supplemental staff who assist in care coordination, development of ACO-wide electronic medical records and a higher degree of collaboration and communication among providers in the ACO network (Online Supplement 1 reference 22). However, the study sounded notes of caution relating to the bureaucratic requirements ACOs impose, including referral restrictions, quality monitoring and reporting.

A third study analysed interviews with executives, managers and clinicians at four private sector ACOs to understand how organizational culture change supports the achievement of ACO goals (Online Supplement 1 reference 48). The key cultural shift identified was one from value to volume, which required shifting from organizational and physician accountability to quality outcomes. Challenges to accomplishing this included the ‘open attribution model’ whereby patients may seek care from any provider, despite ACO accountability. Interviewees described using
patient engagement and education as well as interdisciplinary and cross-sectoral collaboration to address this challenge. An additional challenge to fostering a value culture was posed by the retrospective nature of claims data, which makes timely evaluation of quality-improvement initiatives difficult.

A fourth study surveyed 33 emergency department directors (26 were directors of ACO-aligned emergency departments) in Massachusetts about strategies used in emergency departments to support ACO objectives (Online Supplement 1 reference 29). Both ACO and non-ACO aligned respondents frequently reported using case management (85% of respondents) and information technology (61%) to reduce costs and admissions. ACO emergency department directors also reported making use of clinical pathways, observation units, and the Medicare three-Day Waiver which allows direct placement into a skilled nursing facility without the standard requirement for a three-day hospital stay. Emergency department directors reported barriers to meeting ACO goals including difficulty coordinating, especially with primary care; physician unfamiliarity with ACO objectives; lack of outcome measurements and lack of financial incentives.

Finally, a mixed-methods study included a thematic analysis of interviews focused on integrating mental health care into primary care in three states (Online Supplement 1 reference 31). Interviewees included state officials, organizational representatives and providers from ACOs as well as from other services supported by State Innovation Model funds. Facilitators to integrating mental health in ACOs and other SIM-supported organizations included tracking mental health quality metrics; integrating mental health in bundled funding; encouraging interprofessional consultation through remote consultation and co-location; fostering informal provider relationships; and developing shared resources including online resource libraries. Barriers included difficulties sharing data between providers given technical and legal constraints, differing professional perspectives between mental health and primary care providers, lack of tailored technical assistance, shortages of mental healthcare providers and differing degrees of implementation across providers.

Discussion

Principal findings

The reviewed studies suggest that ACOs reduce costs without reducing quality. In addition, while evidence suggests that quality indicators may improve after ACO implementation, changes are often small and metrics such as hospital readmissions or care for specific disorders may not be affected. Cost savings were largely attributable to savings in outpatient expenses among the most medically complex patients and to reductions of low-value services. Cost savings across the ACO models were modest, notably for PGPs and MSSPs, which in many cases did not produce enough savings to receive bonuses. Most ACO models were found to meet the majority of the quality measures and performed better than their fee-for-service counterparts. It remains uncertain, however, whether these metrics are adequately measuring the quality of care, as reported in one study. Finally, relatively little evidence was found for the impact of ACOs on provider experience, limiting the extent to which any conclusions could be drawn.

Implications for policy

Since the passage of the Affordable Care Act, the US health care industry has seen a rapid growth in new funding models to improve experiential and health outcomes and reduce per capita spending. Chief among these new funding models are ACOs that number in excess of 700 functioning in the commercial, Medicare and Medicaid markets. While ACOs have a defining architecture (networks of providers held accountable to payers for cost and quality for a defined population), they differ substantially in their geographies and target populations, provider composition (e.g. mix of independent physician practices, hospitals and other organizations), financial models (e.g. mix of upside gain sharing vs. downside financial risk), and cost avoidance and quality enhancement strategies (e.g. care management models for high risk persons, adoption of predictive analytics, care transition planning or shared decision-making).

With their substantial heterogeneity in approaches to financing and delivering healthcare, our findings that ACO impacts are mixed is both encouraging and expected. The findings suggest that quadruple–aim improvements are possible with ACO models. However, while some rigorous evaluations are available, particularly for the MSSP and Pioneer models, more clarity is needed on how ACOs differ in their success based on their organizational characteristics, target populations, risk and gain-sharing strategies and clinical interventions. As findings continue to emerge from these experiences, US policy makers will require more synthesized evidence such as this to adjust their ACO strategies based on the emerging literature.

These findings are also relevant to policy makers in other countries who face similar challenges in making their systems more effective and efficient through various accountability structures, payment mechanisms and care-integration strategies. As scale, pace and heterogeneity of the US ACO innovations dwarf the
magnitude of those in other nations, policy makers should consider what lessons can be learnt from the implementation of ACOs in the USA, bearing in mind that the US healthcare context can differ significantly from that of other countries.

**Implications for research**

Several implications for research can be drawn from our review. First, the literature suggests there is consensus around the call for continued research and continued monitoring of indicators (including continuous monitoring of costs, their rate of growth and how savings are being produced) because of the mixed results from early analysis or because ACOs have had too short a track record to evaluate effects on quality of care and costs. Second, the limited number of studies directly assessing ACOs’ population health outcomes points to the need for enhanced measurement and continuous evaluation in this specific area.2 Lastly, the lack of research evidence about how and why impacts are achieved in ACOs points to the need for further process evaluations (e.g. by interviewing leaders about what they found to be the essential components for success, as well as what factors acted as barriers to implementation).

**Strengths and limitations**

The main strengths of this review are that it provides synthesized evidence about an important system-level intervention and that it complements an existing systematic review that provides findings related to utilization and process-related outcomes. However, there are some limitations to our study, which primarily relate to this review being conducted in a compressed time frame. First, while a comprehensive search was conducted in two databases, there was insufficient time to search other databases, to ensure comprehensiveness. Second, no quality appraisal was conducted for primary studies – although making such methodological trade-offs is consistent with the time-limited approach taken in other rapid review methodologies. In relation to quality, a number of the studies included in this review, particularly those that examined patient engagement, used self-reported data and may be subject to response bias. Third, a lack of available data to address each question or all three of the Quadruple-Aim outcomes limits the reliability of findings; however, this highlights a need for continued monitoring of indicators and further research to assess impacts.

**Conclusion**

Policy makers have increasingly advocated for and adopted the ACO model, an apparent shift away from volume-based payment towards value-based care and an emphasis on achieving population health outcomes. While evidence suggests ACOs reduce costs and may improve quality, more research is needed to determine whether ACOs result in better patient experience of care and population health. The available research generally supports the continued piloting and close monitoring of ACOs. This should enable a greater understanding of the steps needed to ensure ACOs and other value-based models produce improved population health and continued cost savings.

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**Supplemental material**

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