

Evidence Check

Accountable care organisations

An **Evidence Check** rapid review brokered by the Sax Institute for the NSW Agency for Clinical Innovation. April 2018.

This report was prepared by:

David Peiris, Madeline News, Kellie Nallaiah with support from an international expert advisory group (members: Stephen Jan, Carrie Colla, Alexander Pimperl, Oliver Groene, Julien Mosques, Tracy Johnson, and Daniel Northam-Jones).

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Enquiries regarding this report may be directed to the:

Principal Analyst
Knowledge Exchange Program
Sax Institute
www.saxinstitute.org.au
knowledge.exchange@saxinstitute.org.au
Phone: +61 2 91889500

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List of acronyms

ACC	Accountable Care Collaborative
ACCHS	Aboriginal Community Controlled Health Service
ACO	Accountable Care Organisation
AHC	Accountable Health Community
AQC	Alternative Quality Contract
A & E	Accident & Emergency
BCBSMA	Blue Cross Blue Shield of Massachusetts
CCG	Clinical Commissions Group
CCO	Coordinated Care Organisation
CMMI	Centers for Medicare & Medicaid Services Innovation
CMS	Centers for Medicare & Medicaid Services
DOH	Department of Health
EHR	Electronic Health Record
EM	Electronic Medical Record
ER	Emergency Room
ESRD	End Stage Renal Disease
FFS	Fee for Service
FLO	Florence Simple Telehealth
FY	Financial Year
HCP	Health Care Partners
HCH	Health Care Homes
HIT	Health Information Technology
HMO	Health Maintenance Organisation
iCMP	integrated Care Management Program
LHD	Local Health District
MIG	Medical Interoperability Gateway
MSSP	Medicare Shared Savings Program
NCD	Non-Communicable Disease
NHS	National Health Services
PCMP	Primary Care Providers
PHM	Population Health Management
PHN	Primary Health Network
PRISM	Profiling Risk Integration and Self-Management Model
QI	Quality Improvement
RCCO	Regional Care Collaborative Organisation
SDAC	Statewide Data & Analytics Contractor
TMC	Tucson Medical Centre

Executive summary

Background / Purpose of the review

The NSW Health Integrated Care Strategy is focused on transforming healthcare delivery to improve health outcomes, patient experience and efficiency. Implementing integrated care involves changes at system, organisation, professional, clinical and consumer levels. The strategy recognises a broader shift in NSW Health towards value-based healthcare and an emphasis on partnerships between Local Health Districts (LHDs) and Primary Health Networks (PHNs).

Accountable care organisations (ACOs) are delivery system reform models that are emerging internationally as a solution to improve health outcomes and patient experience and to reduce costs of care. An ACO brings together multiple providers who agree to be held accountable for financial and quality outcomes for a defined population. Given the shift in NSW Health towards value-based healthcare, the applicability of ACOs in the NSW health system context warrants consideration. The NSW Agency for Clinical Innovation asked the Sax Institute to commission this review in which we: (1) examined the evidence that ACOs and their component features improve health system performance; and (2) took the insights from this evidence and undertook a thought leadership activity to inform strategic approaches to innovation in integrated care in NSW.

Review questions

The review aimed to address the following three questions:

1. What are the purposes and features of existing ACO and Accountable Care Community models?
2. How effective have ACO models been to improve health outcomes and patient experience and to reduce costs of care?
3. What barriers and enablers to successful implementation of ACO models have been identified?

Summary of methods

We searched relevant literature from both peer-reviewed and grey literature sources between January 2006 and August 2017. We developed search criteria to combine the domains of integrated care, alternative payment models and quality of care. Two reviewers extracted data to describe ACO structure, population served, payer models, provider type and outcomes in the domains of quality, cost and patient experience. Additional notes were made on those models that described implementation barriers and enablers. We presented initial findings to the Agency for Clinical Innovation (ACI) and a workshop was held to identify 10 case studies that could potentially be relevant in the NSW health system context to address question three, above. We selected a diverse range of case studies on the basis of data availability, payer, provider and population mix and positive outcomes.

Key findings

Seventy papers met the criteria for inclusion in the review and these papers described 146 ACO models. The majority of evaluations of ACOs were low quality, with only nine studies using a quasi-experimental design. There have been no randomised controlled trials conducted to date.

Question 1:

The vast majority of models were from the US (n=121), while the remaining models were from Singapore, Denmark, Sweden, New Zealand, Spain, Germany, Britain and the Netherlands. There was a mixed range of payers including commercial insurers (n=49), state/regional governments (n=24), national governments (n=13) and multi-payer models (n=60). In terms of provider structure, there were broadly three types: those that were mixed health professional teams (n=65), mainly physician and/or primary care-led (n=41), organisations that included social care providers (n=17) and a range of other provider types (n=22). The majority of models targeted the general population (n=58), the US Medicare models included people with a disability or aged over 65 years (n=22), and socioeconomically disadvantaged individuals were the focus in programs serviced mainly by US Medicaid programs (n=27).

Financial incentives mainly included 'one-sided risk' arrangements in which any savings below a pre-defined expenditure benchmark were shared with the payer. A few models consisted of 'two-sided risk'

arrangements in which the ACO received a greater proportion of any savings, but also incurred penalties if costs exceeded expenditure benchmarks. In addition to these risk-sharing arrangements, a broad range of additional incentives were being implemented within ACOs to encourage providers to engage in population health management and move away from fee-for-service models.

Question 2:

Sixty-eight models had documented cost, patient experience and care quality outcomes but only 17 models reported outcomes across all three of these domains. Barriers and enablers to implementation were described for 31 of the models, but these descriptions generally lacked detail.

- **Cost:** About half of all models reported some form of reduction in total healthcare costs relative to expenditure benchmarks but these were mostly before–after, non-independent evaluations. Some studies reported cost reductions for high-risk patients. In the US Medicare Shared Savings Program overall savings were modest in the first three performance years (<1% overall) but there was wide variability, with 36% of ACOs achieving savings >2% and 13% reporting losses of >2%. Higher expenditure benchmarks were weakly associated with savings in US Medicare programs. However, overall there were few clear predictors of what types of ACOs were making savings, which is possibly indicative of the early stages of implementation of these models in most settings.
- **Quality:** Quality of care outcomes focused on hospital admissions/re-admissions, unnecessary emergency department visits, outpatient clinic services, processes of care, patient adherence rates to treatment plans, and disease management. Although the quality of the evidence on which to assess improvements was variable, most models with outcome data reported one or more improvements in various quality of care indicators. Of nine models that reported on mortality outcomes, six models reported reductions in mortality rates or improvements in life expectancy and three models reported no difference. Five of these models had a matched control group.
- **Patient experience:** The majority of models that documented patient experience showed improvements in patient contentment with particular aspects of care, wait times, better access to information, and an increase in doctor–patient communication, although it should be noted that baseline experience scores tended to be high and consequently these measures may have reduced utility in assessing changes over time.

Question 3:

We identified nine models that met the inclusion criteria for a more detailed analysis of their implementation — six models were individual ACOs and three comprised multiple ACOs participating in a collaboration or program. An additional US model that is early in its inception (Accountable Care Communities) was also included because an explicit aspect of this model is engagement with non-health social service providers. The case studies highlighted the importance of locally specific factors in successful implementation of ACO models. Several implementation factors emerged across the cases that were relevant to the NSW health system. These included:

- **Stimulus funding:** Most models that were successfully implemented attracted initial investment to support their initiation; this funding came from a variety of sources including: internal funding from within the ACO, one-off grants from various funding bodies, allocation of a portion of private insurer budgets to support integrated care initiatives, and government investment (both with and without penalties if outcomes were not achieved)
- **Governance:** In particular, there was a need for strong provider representation in the governance of the ACO and consumer engagement through structures such as citizen boards
- **Population:** Generally these were non-disease-focused populations of fewer than 100,000 people; varied attribution models were used ranging from geographically determined 'all-in' models to retrospective attribution based on claims data
- **Outcomes:** These were reported across several domains, with the inclusion of mandatory reporting indicators for payers plus additional indicators that were derived locally
- **Collaborative learning:** Major infrastructure investments in information management systems supported data analytics and the engagement of providers in quality improvement activities
- **Incentives:** There were flexible incentive designs for providers within the ACO with initial preservation of fee-for-service reimbursement models and transitioning to population-based payments as models matured
- **Coordinated care:** There was a large investment in care co-ordination activities including investment in new workforces of varying skill levels (nurse practitioners, physician assistants, care navigators, peer support workers); commissioning of community services that might go beyond health service provision

(e.g. gym memberships); improved efficiency in specialty referral processes; and systems to identify and eliminate wasteful practices.

Applicability

ACOs bring together several elements of integrated care, underpinned by a financial incentive model, with the goal of moving health systems away from volume- to value-driven services. In Australia, at both federal and state levels there are several policy shifts that signal alignment with this goal. The NSW Health Integrated Care Strategy and more recently several Health Care Homes initiatives (federal, state and local models) have made substantial inroads into supporting this shift. A core element of all these initiatives is the strengthening of the primary health care system and improving the interface between hospital, specialty and primary health care.

To date both state and federal governments have engaged in reasonably weak financial incentives and have prioritised system redesign to improve performance. A fundamental question for policy makers, therefore, is to what extent the financial levers underpinning ACO-like models might accelerate progress towards a higher performing system. Despite the immature evidence base, it is possible ACO models offer an additional lever to increase health system performance. We propose a conceptual framework in which meso-tier organisations, with Local Health Districts and Primary Health Networks at the core, collaborate to form an entity that takes responsibility for total costs and quality of care for a defined population. Such organisations could be considered as highly innovative ‘start-up’ entities that generate new knowledge about the applicability of ACO models to the Australian health system.

Conclusion

Accountable care models are emerging internationally as strategies to foster the development of a high-performing health system. They should be seen as a continuum of approaches that build on many initiatives to promote value-based care. This Evidence Check highlights a large amount of activity in the development of accountable care models, particularly in the US, Britain and Europe. However, evaluations of these models are early in their evolution and the current literature is dominated by low-quality studies. The case study analysis highlights several implementation factors that may be essential to driving success. Many of these factors align closely with existing initiatives in the NSW health system. Despite the immature evidence base, we conclude that incorporating accountable care elements into existing and emerging models in NSW is worth pursuing. Several conceptual factors are discussed in this report to stimulate discussion on how ACO models could be implemented in NSW.

Background

Accountable care organisations (ACOs) are emerging as a solution for improving health outcomes and patient experience and reducing costs of care. A model of multi-dimensional health service integration, an ACO brings together multiple providers who are accountable for financial and quality outcomes for a defined population. Given the shift in NSW Health towards value-based healthcare, ACO models warrant consideration.

ACOs emerged in the US more than 10 years ago but have grown exponentially since the passing of the Affordable Care Act in 2010. Other countries have also developed an interest in these models and several pilot and demonstration projects are being trialled, particularly in Britain and Europe. ACOs vary greatly in terms of provider make-up (integrated delivery systems, multi-specialty groups, primary care physician led), mechanisms to achieve desired outcomes (e.g. promotion of patient-centred medical homes) and contractual options (e.g. alliance contracting and contractual joint ventures). In addition, Accountable Care Communities (ACCs) are emerging as a broader arrangement in which non-traditional healthcare providers such as social and other community service providers are engaged to achieve cost and quality outcomes on a community-wide population basis.

The NSW Health Integrated Care Strategy is focused on delivery system redesign to improve health outcomes and patient experience and to reduce costs of care. It is multifaceted in nature and involves changes at system, organisation, professional and clinical levels. The strategy recognises a broader shift in NSW Health towards value-based healthcare and emphasises partnerships between Local Health Districts and Primary Health Networks.

The Agency for Clinical Innovation (ACI) is the lead agency in NSW for promoting innovation, engaging clinicians and designing and implementing new models of care and is a key partner in the NSW Integrated Care Strategy. ACI engaged the Sax Institute to commission an Evidence Check to examine the evidence that ACOs and their associated elements improve health outcomes and patient experience and reduce costs of care. This Evidence Check is a thought leadership exercise to inform the ACI's strategic approach to innovation in integrated care in NSW.

Purpose

The aims of the Evidence Check are to:

- Conduct an environmental scan to identify ACO models in the literature that may be applicable to NSW
- Review the evidence of their effectiveness on health outcomes, patient experience and costs of care
- Assess barriers and enablers to model implementation for a purposively selected sample of ACO models.

Review questions

The following questions were formulated to address the above aims:

1. What are the purposes and features of existing ACO and ACC models?
2. How effective have ACO models been to improve health outcomes and patient experience and to reduce costs of care?
3. What barriers and enablers to successful implementation of ACO models have been identified?

Following completion of the review, its findings were presented to key NSW stakeholders as part of a facilitated workshop. Workshop participants focused on two broad questions: (1) how are existing ACO models applicable in the NSW health environment; and (2) what capabilities and enablers would be required to successfully implement these models? The discussion generated by these two questions was summarised and the implications were incorporated into this Evidence Check.

Methods

Definition

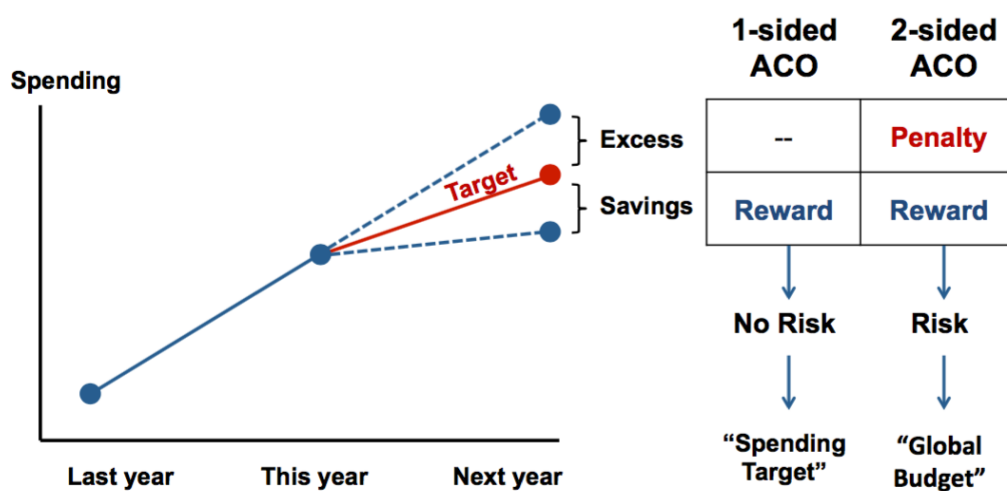
The definition of an ACO is broad for the purpose of this Evidence Check. Essential criteria include models in which:

- Providers contract with a payer/commissioner to take responsibility for the cost and quality of care
- There is a defined population and budget
- Care is managed across the continuum ranging from primary and preventive services through to services delivered in hospitals and residential aged-care facilities.

A fourth desirable criterion was the inclusion of models that had an explicit community engagement component and some notion of accountability to consumers in the structure and functions of the ACO.

Because the evidence base was relatively immature, we used a loose definition of the term 'model'. In some cases, this referred to a specific contract between providers and payers and in other cases to multiple models within a program such as a government or commercial insurer program. We did not explicitly include or exclude specific models on the basis of their names, but rather scrutinised the content of the models to assess whether they met the criteria described above. For example, there is some debate as to whether ACOs differ to any substantive extent from the Health Maintenance Organisations (HMOs) that have been present in the US health system landscape for decades. Although we acknowledge there may be some overlap, the key differences are that HMOs are payer-centric models while ACOs are provider-constituted entities. Another differentiating factor is HMOs are generally more restrictive about which providers a patient can use, whereas ACOs do not restrict provider choice. A third differentiating factor is that ACOs explicitly incorporate quality accountability, addressing a long-held criticism of HMOs, which are seen as being focused primarily on efficiency gains. These distinctions are not always clear, however, and some HMO models embrace many elements associated with an ACO and therefore were not excluded simply because of their name.

A fundamental element of ACOs is providers taking responsibility for the total healthcare expenditure for a defined population. Determining expenditure benchmarks can be complex, but in the simplest scenarios a target benchmark is established based on historical and projected trends in expenditure. In more complex models, expenditure benchmarks take into consideration regional averages and adjustments based on the risk profile of the population served by the ACO. In terms of defining spending accountability, ACOs broadly fall into two categories. In **one-sided models** an ACO benefits from meeting quality and cost targets by sharing in a portion of the savings (typically 50%) but does not incur any penalties for cost overruns. In **two-sided models** an ACO typically receives a greater proportion of any savings but also takes on the risk of incurring a penalty if it spends beyond the target expenditure benchmark. The models are diagrammatically represented in Figure 1:



Source: Personal communication Z Song, Harvard TH Chan School of Public Health

Figure 1: Risk sharing in Accountable Care Organisation models

Peer review literature

Searches were generated and combined across three broad domains: integrated care models, alternative payment models and quality of care. Initial search terms (either as medical subject heading, title or keyword searches) in each of these domains included:

Integrated care

(health care, care, model, delivery model) AND any of the following (integrated, team, team-based, multi-professional, multisector, multiagency, interdisciplinary care, seamless, continuity, coordinated, partnership, shared, joined-up, pooling, vertical, horizontal, collaborative, cross-organisational, intermediate care, joint care, all-inclusive, comprehensive, total care, interface, service interaction, patient care team)

Alternative payment models

Accountable care organizations, accountable care organisations, accountable care, accountable care communities, value based care, value based insurance, value based purchasing, risk sharing, financial, reimbursement, incentive, managed care programs, health maintenance organization, alternative payment, cost sharing

Quality of care

quality, quality of healthcare, quality of care, total quality management, clinical performance assessment, clinical competence, guideline adherence, performance measurement, outcome assessment/measurement, process assessment/measurement, quality assurance, quality improvement and quality indicators

Searches were limited to literature published from January 2006 to August 2017. The final search terms used are included in Appendix 1.

Inclusion/exclusion criteria

Articles were excluded at the title review stage if none of the focus areas of interest, above, were present in the title. Articles proceeding to abstract review were then examined for relevance and were excluded if the key search terms, above, were not present. At full text review, articles were excluded if they did not include examples of specific models. Expert opinion from an international advisory group was sought and further targeted internet searches were also conducted to locate grey literature on additional models and provide further information on the models found in the literature review. Endnote was used to manage articles retrieved.

Case study selection

After the review team had completed questions 1 and 2, the Sax Institute facilitated a workshop with the reviewers and the ACI Primary Care and Chronic Services Directorate. The workshop prioritised the ACO models that were broadly applicable to the NSW health system and we examined these models to complete question 3. We prioritised models that had been implemented and evaluated. Criteria for inclusion were:

1. Models that were relatively advanced in their development
2. Diverse payer arrangements (federal government, regional/state government, commercial insurer or a multi-payer arrangement)
3. Models that were of potential relevance in the NSW health system context
4. Availability of outcome evaluation data.

For the case studies, we conducted an additional desktop search for relevant grey literature. This included organisation websites, annual reports, blogs and commentaries. Expert opinion was also sought from several people who were involved in the implementation of some of the ACO models and they reviewed the case study summaries that we prepared (Appendix 5).

ACO framework

McClellan and colleagues' ACO framework was used to extract information for the case studies. This framework was developed by an international working group to describe and assess efforts to implement accountable care in diverse settings around the world.¹ It was primarily based on a literature review and semi-structured interviews with working group members. The framework comprises five domains:

- **Population** — defining a specified population for which providers are jointly accountable
- **Performance** — determining target outcomes for the specified population, including resource use
- **Metrics and learning** — developing and refining metrics to help determine whether outcomes are improving and to learn from these measurements and variations in results
- **Payment and incentives** — restructuring payments and other incentives to align with the target outcomes, including details of risk-sharing arrangements
- **Coordinated delivery** — implementing steps to coordinate the delivery of care within teams of clinicians, across providers, and between providers and patients to improve that delivery.

A hierarchy of elements within each domain was developed to rank the level of progress being made in each component area (Table 1). For the case study review, we used this as a guide when extracting and analysing information on model elements.

Table 1: Accountable care framework — component rankings according to level of maturity¹

Rank	Population	Outcomes	Metrics and learning	Payments and incentives	Coordinated delivery
5	Intersections between different morbidity groups carefully planned and accounted for	Outcomes that matter to people; prioritised according to individual goals	Aggregated longitudinal data made public in format consistent across providers	Full capitation with minimum required quality standards; differential payments according to outcomes	Clinical and data integration across full provider network; patients co-design care
4	At-risk individuals identified using comprehensive data sources	Focus on prevention and wellness; goals adjusted according to patient risk level	Results shared with patients in usable form; monitoring built into clinical workflow	Upside and downside shared savings; strong professional competition	Patients empowered to self-care; care plan and managed transitions
3	Registry of population integrated with electronic health record	Goals comparable with those of other providers and aligned with	Real-time and summary learning; results shared with	Shared upside savings and risk for patients' whole health;	Clinicians empowered to adjust interventions to

		clinical global best practice	payer and clinicians	performance bonus to staff	improve outcomes
2	Defined population (for example, by morbidity, age, geography or payer)	Incorporation of patient experience into targets	Evidence-based leading clinical indicators linked to outcomes	Bundled payments with quality controls for episodes of care	Multidisciplinary team meetings; all team members used to maximum potential
1	Patient-based (instead of disease-based) view of existing funding and providers	Basic clinical outcomes decided at local level	Administrative measures, limited transparency, summary evaluation only	Pay-for- performance bonuses on top of fee-for- service or block payments	Basic electronic data-sharing across providers
0	No identified population	No target outcomes	No metrics or learning	Payments for activities only	Uncoordinated provision of elements of care

Findings

Database search

The electronic database search yielded 2254 articles. Duplicates (n=419) were removed and 1835 articles were reviewed by title. We excluded articles if key words were not present in the title (n=482). Abstracts were then reviewed and articles not containing the focus points of the Evidence Check (description of type of models and their implementation) in the abstract were removed (n=1057). The full texts of 296 articles were then reviewed and, of these, 234 were found to be out of scope (the body of the article did not describe the type of models and their implementation). An additional 8 papers were included on recommendation from the expert advisory group. Seventy papers were included in the review (Appendix 2).

Question 1: What are the purposes and features of existing Accountable Care Organisations and Accountable Care Community models?

A total of 146 models were described with varying degrees of detail in the 70 included articles (Figure 2). The majority of identified models were from the US (n=121), largely attributable to programs arising from the 2010 Affordable Care Act. The remaining models (n=25) were from Singapore (n=1), Denmark (n=1), Sweden (n=1), New Zealand (n=1), Spain (n=1), Germany (n=2), Britain (n=7) and the Netherlands (n=11). Although all models focused on improving outcomes in quality, patient experience and costs, there were varying priority areas within models, namely, improving complex care management and preventive care services, avoiding unnecessary hospital admissions and emergency department attendance, improving care navigation with community services, and greater provider alignment across health networks.

In terms of payers, 49 models involved commercial insurers, 60 included mixed payer contracts, 24 included a state/regional government and 13 had a national government payer. In terms of provider structure, there were broadly three types: those that were mixed health professional teams (n=65), mainly physician and/or primary care-led (n=41), and organisations that included social care providers (n=17). Information on the provider setting for a number of models could not be determined from the literature available (n=21).

The majority of models targeted the general population (n=58), usually by participating in an insurance plan from a payer contracting with the ACO. The remaining target populations included mainly US Medicare-eligible people (aged over 65 years or with a disability, n=22) and individuals classified as socioeconomically disadvantaged (n=27). Beneficiaries within this last group were primarily serviced by US Medicaid programs. Many models lacked sufficient detail to identify the target populations (n=39).

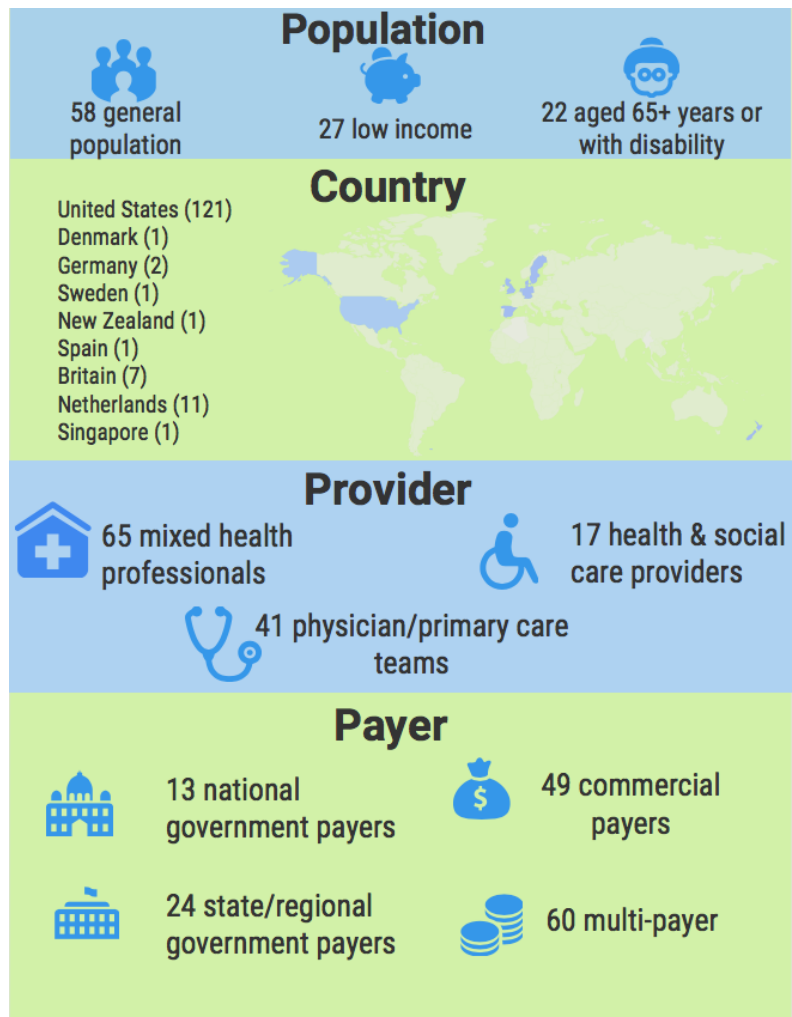


Figure 2: Number of models by structural characteristics

Question 2: How effective have ACO models been to improve health outcomes and patient experience and to reduce costs of care?

The strength of evidence found in the literature review was low as the majority of papers were case studies (n=33) or reviews (n=25). In addition, most were commissioned or conducted by the organisation implementing or governing the model so there might be some degree of bias in the evidence presented. There were only a small number of quasi-experimental studies (n=9) that used matched control groups to assess outcomes of the models. Only a few models used a qualitative design (n=3).

There were a limited number of models with outcome data and descriptions of enablers and barriers available (n=68). We accessed published independent evaluations to determine cost, patient experience and care quality outcomes. Of the 68 models with outcomes reported, only 17 had all three outcomes described (Figure 3). Thirty-one models had some description of implementation barriers and enablers included, but generally these descriptions were cursory (see Appendix 3 for source articles).

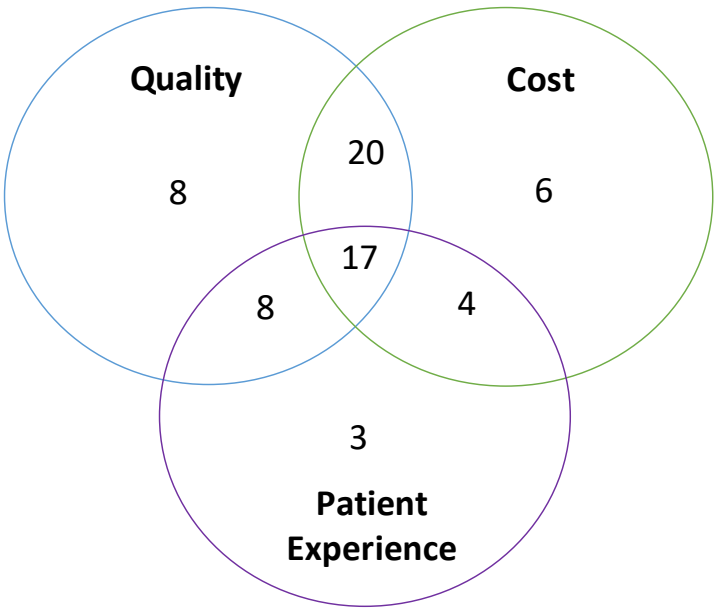


Figure 3 — Models reporting outcomes

Models in the US mainly reported outcomes based on a predetermined set of quality measures set out by the Centers for Medicare & Medicaid Services (CMS). In total, 33 indicators across four domains were used for the first three reporting periods (2013–2015) and are shown in Appendix 4. The patient/caregiver experience data reported for ACOs participating in CMS programs are based on a survey of a random sample of beneficiaries conducted by a third party. Claims data are used for the remainder of the indicators. A total quality score is aggregated for these 33 measures (100 points being maximum). Some indicators are ‘reporting only’ indicators, where the maximum score is allocated if minimum data are reported regardless of the actual performance score for that indicator. This is mainly applicable in the first performance year of entering the program and in subsequent years the actual score is used to assess overall quality scores.

The remaining US models used varying cost and quality metrics. Where these models were engaged in CMS programs they included the mandatory 33 measures described above plus additional locally specific measures. Non-US models did not have a set framework of cost and quality metrics available or defined but generally adhered to measures that align with the ‘triple aim’ of improving the health of populations, patient experience of care and per capita costs. There were no quantitative evaluations that assessed provider satisfaction.

Cost

Forty-seven models reported outcomes on cost (Figure 1). Outcomes included proportion of shared savings, percentage decreases in total cost of care, expenditure reductions for high-risk patients and overall return on investment (n=3) (Table 1). There was some suggestion of a learning effect, with savings increasing with length of time participating in the ACO program. The size of savings appears to be highly variable between

ACOs. Performance data from the US Medicare Shared Savings Program for the first three performance years (2013–2015) show the median savings has been modestly positive each year (0.16% to 0.45% savings); 36% of ACOs were achieving savings >2% while 13% reported losses >2%. The savings distribution has been broadly similar each year with no evidence to date of any reduction in mean or median savings (Figure 3). It should be noted, however, that these reported savings do not take into consideration any up-front investments made by the ACO and so real savings initially may be much smaller and the return on this initial investment may take several years to accrue.

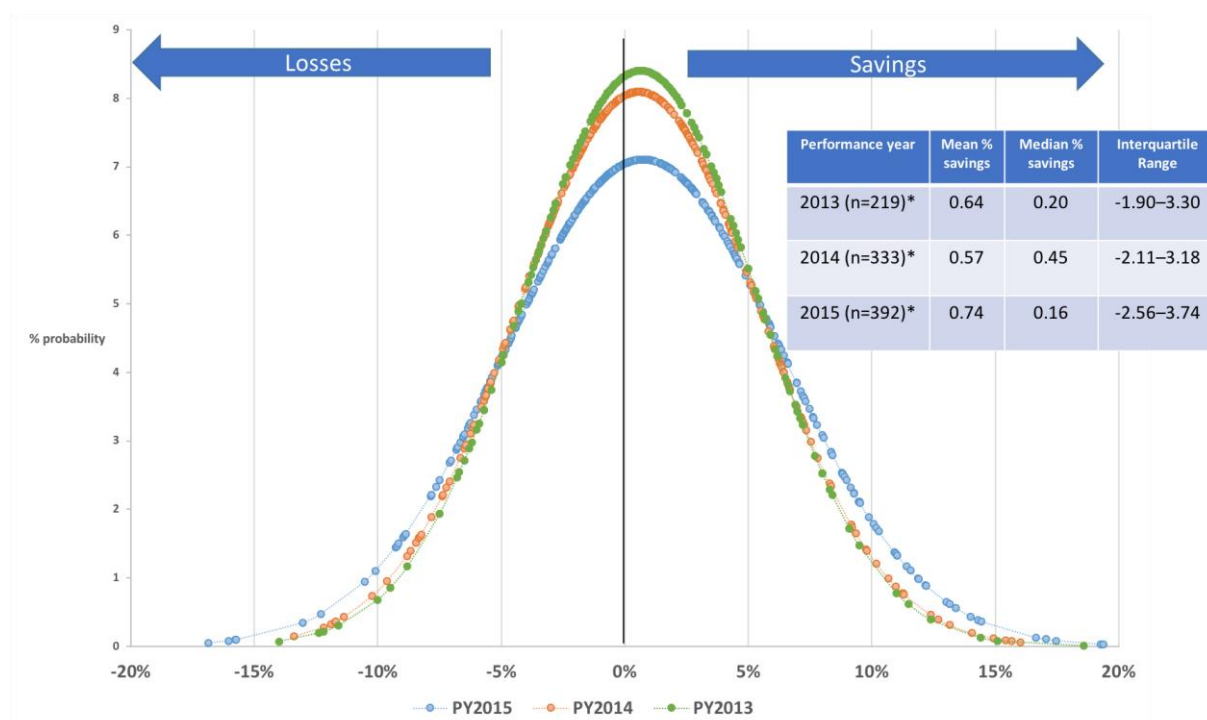


Figure 4. Normalised distribution of expenditure outcomes for ACOs participating in the US Medicare Shared Savings Program*

*Constructed by authors from CMS data² (*Outliers removed)*

The size of savings is mildly correlated with the size of the per capita benchmark target, suggesting ACOs whose baseline expenditure is relatively high going into the program may have a higher likelihood of making greater savings (Figure 5).

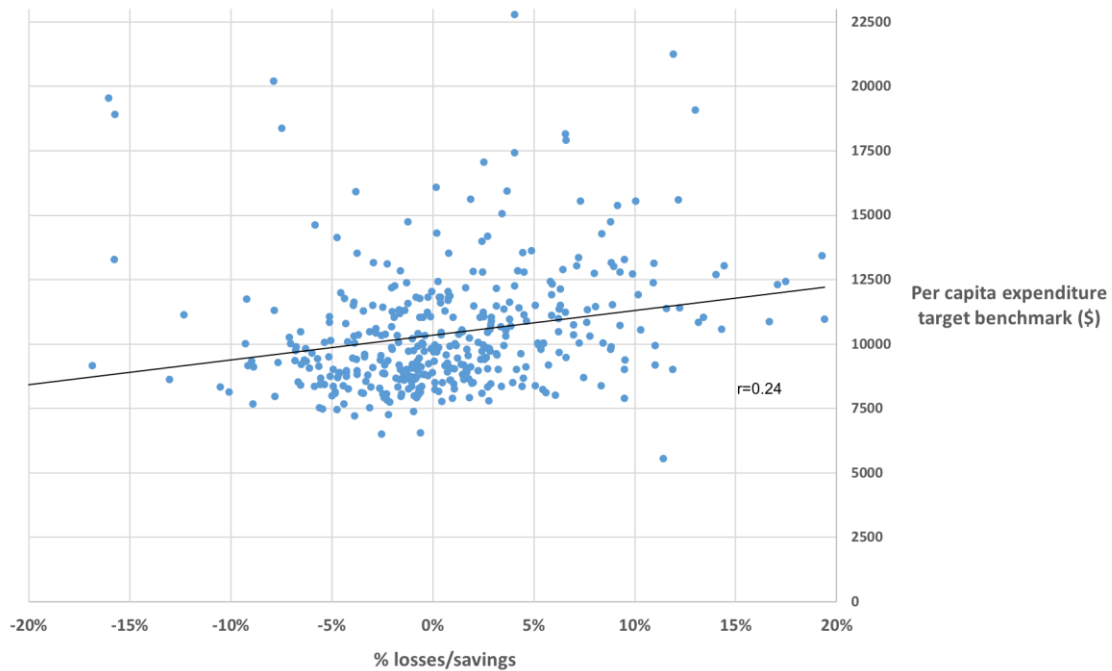


Figure 5. Correlation between per capita target benchmark and % savings for ACOs participating in the US Medicare Shared Savings Program (n=392)

Constructed by authors from CMS using 2015 performance year data (Outliers removed)

Quality

Fifty-three models reported outcomes on quality of care (Figure 3). Outcomes included hospital admissions/readmissions, unnecessary emergency department visits, outpatient clinic services, processes of care, patient adherence rates to treatment plans, disease management and lowering mortality rates (Table 2.) Only nine models reported on mortality outcomes, with six reporting reductions in mortality rates or improvements in life expectancy and three reporting no difference. Five of these models had a matched control group. Improvements in social care, mental health and housing services were reported in some studies that targeted socioeconomically disadvantaged populations. Although some studies described no significant difference in quality outcomes, these were sparsely reported and generally did not provide any specific quantitative estimates to substantiate this claim.

Performance data from the US Medicare Shared Savings Program for 303 ACOs with quality scores showed high total overall scores (median score 93.6%). There appeared to be little association between quality and savings scores with an approximately equal distribution of ACOs across all combinations of cost and quality outcomes (Figure 6).



Figure 6: Relationship between quality scores and savings for 303 ACOs participating in the Medicare Shared Savings Program

Constructed by authors from CMS data from 2015 performance year²

Patient experience

Thirty-two models reported outcomes on patient experience (Figure 3). Outcomes primarily involved patient satisfaction levels, waiting times, better access to information and an increase in doctor–patient communication (Table 2). The vast majority of patient experience outcomes were reported as before–after measures in case studies ($n=27$). In general, stronger forms of evidence (such as reviews, evaluation and quasi-experimental studies) did not include outcomes with detailed information on patient experience. There was limited evidence of worsening outcomes and most studies did not provide quantitative measures to support this. Three studies reported no significant improvements in patient experience and these models were all Medicaid initiatives with a target population of socioeconomically disadvantaged populations.

Table 2. Reported outcomes (68 of 146 models with available data)

Outcomes	Number of models ¹	Improvements reported ²	No significant improvement/ worsening of outcomes ³
Patient experience	32	<ul style="list-style-type: none"> Improved patient satisfaction scores (n=9) (12%–39%)^{1, 3–11} Reduced waiting times (n=3); reduced time to see specialists (25 days), quicker access to surgery (14–34 days), CAT scans (12 days) and MRI scans (15 days)^{1, 5, 8, 11–13} Better informed/improved perception of health status (n=9)^{8, 11, 14–16} Improved communication with health professionals (n=11)^{7, 8, 11, 14, 15, 17, 18} 	<ul style="list-style-type: none"> No improvements in timeliness of care^{13, 19} Minimal effects on overall service experience⁸
Cost savings	47	<ul style="list-style-type: none"> Cost reductions for high-risk patients (n=6) (3%–38%)^{6, 8, 16, 20–24} Savings achieved (n=13) (1%–8.4%)^{1, 5, 12, 17, 21, 25–28} Decrease in total cost of care (n=9) (3%–28%)^{5, 8, 24, 29–34} Return on investment (n=3)^{8, 9, 35, 36} 	<ul style="list-style-type: none"> No differences in total Medicaid costs^{32, 37} No difference in inpatient costs^{8, 17, 37} No difference in emergency department (ED) costs^{30, 37, 38} No difference in long-term costs^{8, 17}
Quality of care	53	<ul style="list-style-type: none"> Reduction in hospital admission/ readmissions (n=5) (1.1%–54%)^{3, 5, 9, 11, 14, 15, 17, 22, 34, 35, 39} Reduction in ED utilisation (n=4) (4%–9.1%)^{7, 12, 23, 25, 34} Improved disease management (n=3) (3.7%–13%)^{8, 9, 11, 23, 26, 31, 34, 40–42} Improved processes of care (n=2) (15%–98%)^{8, 23, 31, 34, 35, 38, 43} Reduction in unnecessary services (n=3) (15%–98%)^{3, 9, 15, 17, 44} Increased outpatient clinic visits (n=3) (3.3%–45% per month)^{8, 9, 11, 26} Increased patient adherence rates [medication, treatment plans] (n=2) (30%–89%)^{8, 18, 21, 32, 43} Lower mortality in intervention vs. control (n=6) (3%–3.9% mortality reduction; 1.25–1.4 years increase in life expectancy)^{8, 12, 23, 41, 45} 	<ul style="list-style-type: none"> No difference in mortality rates^{8, 10} Increased hospital admissions^{23, 44} Increased ED visits⁴⁴ Increased use/cost of screening services^{17, 37}

Notes:

1. Total number of models reporting at least one outcome measure in each of the domains
2. n= the number of models reporting quantitative outcome improvements. Effect sizes are the range of estimates across all models that reported an outcome. References include both models with quantitative and qualitative outcomes (improvement reported but size of effect not reported).
3. The models that reported no improvement only provided qualitative statements to support this claim (see reference list for more details of the specific models).

Question 3: What barriers and enablers to successful implementation of ACO models have been identified?

Nine models were identified that met the inclusion criteria for a more detailed analysis of their implementation — six models were individual ACOs and three comprised multiple ACOs (Brookings–Dartmouth ACO collaborative, Colorado Regional Care Collaborative Organisations and Oregon Coordinated Care Organisations). An additional US model that is early in its inception (Accountable Care Communities) was also included, although no outcome data are available. Table 3 shows the models included:

Table 3: Models included for case study analysis

	Model	Country	Payer	Population
1	Partners HealthCare	US	Centers for Medicare & Medicaid (CMS) (Pioneer program)	Medicare members (aged over 65 years and those eligible due to a disability)
2	Alternative Quality Contract	US	Commercial insurer — Blue Cross Blue Shield of Massachusetts (BCBSMA)	BCBSMA Health Maintenance Organisation members
3	Coastal Medical ACO	US	CMS (Medicare Shared Savings Program)	Medicare patients
4	Brookings–Dartmouth ACO Collaborative	US	Multi-payer commercial insurers and CMS	Combination of Medicare and insurance plan members
5	Regional Care Collaborative Organisations	US	Colorado state government Medicaid initiative	Medicaid members (those meeting a poverty level threshold variably defined by each US state)
6	Co-ordinated Care Organisations	US	Oregon state government Medicaid initiative	Medicaid members
7	Accountable Care Communities	US	CMS	Medicare and Medicaid members
8	Gesundes Kinzigtal	Germany	Two regional, commercial insurers	All those insured with one of two statutory health insurers in a defined region combined with opt-in consent for specific care programs
9	Ribera Salud	Spain	Valencia regional government	All residents within a defined region
10	Better Together (Nottinghamshire)	Britain	National Health Service	All residents within a defined region

A detailed appraisal of each model using the ACO framework is included in Appendix 5. The case studies highlight the importance of locally specific factors in the successful implementation of ACO models. Several

implementation factors are common across these cases and these are summarised below based on overall governance and the ACO framework domains.

Governance: In all the case studies effective leadership at multiple levels throughout the organisation was a critical enabler. Executive leadership was clearly important, but engaging providers and provider groups in the governance of the ACO and setting its strategic priorities was also important. In some ACOs, like *Gesundes Kinzigtal*, providers held majority equity in the ACO and therefore drove decisions about strategy, funding and distribution of incentives. Another key factor emphasised by some ACO models and networks (*Brookings–Dartmouth* and *Gesundes Kinzigtal*) was the need for long-term contracts to allow providers sufficient time to acquire new capacity to engage with care delivery changes. The US models tended to have no citizen representation in the governance structures; however, the German (*Gesundes Kinzigtal*) and British models (*Better Together*) emphasised citizen engagement as being central to the leadership and activities of the ACO.

Population: There was a wide range of population sizes and make-up in the case studies. In most ACOs size was determined by the payer arrangements (either an attributed population based on previous claims data (*Partners*, *Coastal Medical*, *Monarch Healthcare*), part of an existing coverage arrangement (e.g. existing members covered under a *Blue Cross Blue Shield* plan), or regionally determined, such as with the European models. Population size varied greatly, from about 10,000 people to as large as 250,000 with *Ribera Salud*. *Gesundes Kinzigtal* had a philosophy that numbers should not exceed about 100,000 people; otherwise physician networks became too dispersed and there was less opportunity for collaborative networks to form.

Performance: The case studies tended to use blended performance measures comprising a combination of mandatory reporting to the payer and locally derived sets for quality improvement (QI) programs. The complexity and breadth of indicators that could be collected was dependent on sufficiently robust information management systems. Some programs also highlighted the importance of provider acceptance of these indicators and the need for robust underlying data to support their acceptance (*Colorado*). In one case study there were some concerns about unintended consequences from incentivising certain indicators and under-cutting others. Non-incentivised indicators including chlamydia screening, cervical cancer screening and well-child visit rates all declined over the first 15 months of the program. Aside from this isolated example, there was little evidence of this issue in other case studies. Several ACOs had also undertaken independent evaluations (*Blue Cross Blue Shield*, *Oregon*, *Colorado*, *Gesundes Kinzigtal*) and these tended to use more robust methodological designs to assess outcomes.

Metrics and learning: All ACO case studies invested in information systems, development of appropriate metrics and engaging providers in regular use of data to analyse and act on areas of performance variation. Key elements undertaken by most of the case study organisations included the following:

- Strategies to promote optimal use of electronic health records (EHRs)
- Data-sharing arrangements between providers and practice
- Use of data analytics such as provider dashboards that allow for drilling down to patient-level information and for peer-ranked performance feedback
- Use of risk stratification tools to identify chronic and complex care patients.

Payment and Incentives: Although a return to providers of any savings incurred was fundamental to ACO arrangements, the manner in which these incentives were distributed was highly variable. Most ACOs retained some portion of any savings to support operational functions, but the majority was generally distributed either to practices or individual providers. However, incentives at the provider level remained relatively small compared with income generated from fee-for-service activities. For example, in the *Ribera Salud* model only about 10% of provider income was related to performance incentives. There was considerable missing detail, however, on what additional incentives were available for providers. Some ACOs paid providers for participation in quality improvement ‘circles’ (e.g. *Gesundes Kinzigtal*) and others received additional bonus payments for other activities. Consequently, provider-level incentives may not need to be

large to engage providers and the maintenance of fee-for-service arrangements may be attractive to providers as it does not disrupt the status quo.

Coordinated care: Perhaps the strongest potential for ACOs to transform prevailing models of care was in the promotion of coordinated care. Case study organisations were making varied efforts to promote integration of care across the continuum from primary prevention to inpatient care. Investment in collaborative networks included both clinical and operational staff. Measures included investing in telehealth services and facilitating after-hours access to the general practice electronic health record (Better Together), employment of a new care coordinator workforce with differing skill levels (Blue Cross Blue Shield, Ribera Salud), programs to integrate behavioural health with primary care (Partners), and strategies to eliminate duplication of services and overuse of unnecessary services (Blue Cross Blue Shield). Although outcome data are yet to emerge, two ACO case studies are actively engaging social care services (ACC programs, Better Together) in addressing fragmented health and social service delivery, and the successes and challenges of such models will be awaited with interest.

Another important implementation enabler was the role of initial infrastructure investments to transform the ACO from prevailing models of care. Some ACOs such as the Oregon model received exceptional and large federal government funding injections to initiate the program (US\$1.9 billion over five years). Although the state government was held accountable for this stimulus package and could incur penalties, this start-up funding allowed for important investments in technical and workforce capacity. In commercial payer ACOs similar up-front investments were made by the insurer (e.g. Blue Cross Blue Shield), while in other models external grant funding was sought by the ACO or internal revenue was allocated for infrastructure upgrades (Gesundes Kinzigtal, Partners, Coastal Medical). In Germany, as part of the German Health Care Act, insurance companies are required to invest 1% of their budget into integrated care contracts and this was leveraged as start-up investment funds in the Gesundes Kinzigtal model. Another strategy to support a critical mass of infrastructure support was through the formation of learning collaboratives in which multiple ACOs worked together and used their collective experience to achieve shared objectives (e.g. the Brookings–Dartmouth ACO collaborative).

Discussion

Although ACOs are evolving rapidly, the evidence base for understanding their role in the healthcare system remains at an early stage. The literature is dominated by case studies and commentaries and most of the evaluations are internally conducted before–after evaluations. Consequently, the knowledge base with which to guide interpretation has major caveats. Despite these caveats, some patterns from the models identified in this Evidence Check are emerging that are instructive for the future direction of ACOs. We discuss these in terms of structure, capability and outcomes.

Structure

ACO structures are highly variable with a broad range of payers (national and regional governments, commercial insurers and mixed payer models) and providers (integrated systems with hospitals included, primary care physician led models, and a few emerging models that include social service providers). Although complexity increases with the breadth and number of providers and payers, there are substantial benefits from having a critical mass of representatives across the healthcare spectrum engaged in ACO contracts. A key success factor seems to be the experience of providers in engaging with alternative payment models. Those ACOs where providers have participated in medical home initiatives, bundled payment schemes and other population-based payment programs may have acquired ‘corporate knowledge’ that supports their engagement in ACO contracts.⁴⁶ For those providers that are relatively new to such contracts there may be considerable inertia that needs to be overcome; however, there is some evidence from the US Medicare programs that there is a learning curve, and that duration of participation in the program is associated with improved outcomes.⁴⁷

In the more robust evaluations, much of the earlier savings have come from improving referral network efficiency (e.g. increasing referral to lower cost specialists).²⁷ In health systems with wide variation in specialist price and out-of-pocket costs this represents a highly effective ‘low-hanging fruit’ from which to realise savings. However, this may not be easy to achieve in health systems where there is less variation in specialist prices and where prices have already been driven low, particularly under a single-payer model such as the British National Health Service. Another challenge with improving hospital efficiency is that there remain perverse incentives not to make efforts to reduce hospitalisation where fee-for-service rates far outweigh any potential savings that may accrue from a shared savings arrangement. Consequently, this can threaten the premise of providers working together to integrate higher quality care at lower cost.

Population selection is also highly varied, with some models regionally defined, others having opt-in enrolment and the majority of the US Medicare programs using retrospective attribution of beneficiaries based on historical claims data. Each of these population attribution models comes with strengths and limitations. Regionally defined models have the benefits of being all-inclusive and avoiding the potential for favourable risk selection either by choosing healthier patients or higher-performing providers to be in the ACO. Opt-in models have the potential for stronger patient engagement in the ACO and give members more ability to promote patient-centred models of care including patient-reported experience and outcome measures. The clear weakness with opt-in models is also related to risk selection and the potential to miss the hardest to reach populations that may be the very group where opportunities to drive both quality and efficiency are greatest. Retrospective attribution models based on claims have the benefit of being easier to manage administratively. However, they have substantial limitations if populations are dynamic and there is a high rate of flux both into and out of the ACO provider group. This gives the ACO diminished ability to influence population health processes and outcomes. It also dramatically reduces patient engagement opportunities. Population size also varies in the models we studied. With some notable exceptions (e.g. Ribera Salud), the populations ranged from about 10,000 to 100,000 people.

Some ACOs have stressed that even more important than restricting the population numbers is the need to ensure physician numbers do not become too great. A potential success factor in some models is that physicians know each other, which fosters a personalised network in which providers are more motivated to work together on quality improvement activities. This raises the possibility that when provider numbers are too large, the system becomes more dependent on strong financial incentives to drive behaviour change. Conversely, with smaller more intimately connected provider groups, non-financial incentives may have a stronger effect and financial incentives do not need to be as strong. This is not to say that larger

organisations cannot foster smaller, more personalised networks within the broader structure. Such a structure may allow economies of scale to be achieved for critical infrastructure support such as information technology, but maintain a grassroots approach that nurtures local provider and consumer engagement.

Capability

There were many examples from the literature where ACOs were either deploying innovative practices or evidence-based practices at a scale to achieve efficiency and quality gains. This was particularly the case in three areas: information management, incentive design and care coordination. The majority of ACO models described large investments in information technology upgrades. This included hardware upgrades, investments in the interoperability of electronic health records (EHRs), strategies to encourage providers to more actively use EHR, data analytics platforms, and the capacity to give regular feedback to providers to allow performance tracking, benchmarking against other providers and participation in collaborative learning. Although a single EHR may represent the gold standard enabler for sharing information, this is not realistic in many systems with greater physician autonomy, and therefore interoperable systems with shared records, secure messaging between providers, and portals to allow patients to view some or all aspects of their EHR are potential strategies for improving exchange of information.

Provider incentive design is complex and no clear patterns emerged from the literature on common design features. In general, although at the ACO level there are substantial changes and incentives to generate and share savings with payers, at the provider level more traditional models of either salary, fee-for-service or fee-for-service with partial capitation for selected populations or health conditions are the norm. With the exception of British National Health Service models (e.g. Better Together), most models do not deploy global capitation payments at both the ACO and provider levels. The case studies highlight that incentives to providers for performance improvement consequently play a relatively minor role in their payment compared with status quo reimbursement models (Appendix 5). Some ACOs also provide financial incentives to providers to participate in quality improvement activities in addition to any savings that might be shared for expenditure reductions.

Investments in primary care medical home structures were prominent in successful ACOs. In particular, many ACOs are making workforce investments to support care coordination and the transition of care from hospital to community. This workforce, however, is complex and varies greatly in skill level and scope of practice. Some ACOs are deploying highly trained nurse practitioners in care coordinator roles while others are engaging lesser trained physician assistants or even lay peer-support workers.

Successful implementation of these capabilities requires substantial initial infrastructure investment. Some models received major government funding to stimulate initial activity while others received support from commercial insurers or self-funded their infrastructure upgrades. These investments are considerable, may far exceed any savings accrued, and consequently may take some years to achieve an acceptable return on investment. Some have commented that such large infrastructure investments preferentially favour large ACOs that can achieve the critical mass needed to justify such outlays, leading to the suggestion that only 'super-ACOs' are able to survive in such an environment.⁴⁸

Outcomes

Based on the available evidence, few definitive conclusions can be made about outcomes for ACO models. The more rigorous, quasi-experimental studies tended to show modest savings and improvements in quality and patient experience scores. Overall in the US Medicare programs, mean savings have remained small at less than 1% but there is a wide variability and some ACOs are achieving savings in excess of 10%. There are also a substantial number of ACOs that remain unable to curb expenditure and are incurring expenditure overruns. Programs that require ACOs to transition to two-sided risk-sharing arrangements may therefore not be sustainable. The degree to which an ACO can save may be driven by a range of factors. Of critical importance are the methods used to derive expenditure benchmarks. For ACOs with relatively high per capita expenditure benchmarks, there may be opportunities to make early savings by 'trimming excess fat'. For other ACOs whose entry benchmarks are low, the opportunities to save may be more difficult. Newer ACO models are using regional, risk-adjusted benchmarks rather than historical benchmarks; this will enable high-performing ACOs to maintain their high performance rather than to perpetually generate savings.

Quality outcomes were subject to large reporting biases and it is again difficult to be definitive about improvements to date. However, most ACO models reported improvements in a variety of clinical and process outcomes and patient experience measures. Although there will always be concerns that quality indicators, when narrowly constructed, may encourage improvement in some areas at the expense of non-

incentivised areas, few studies reported this being a concern to date. Perhaps more important are the processes by which quality indicators are generated and the need for provider and consumer engagement so they can agree jointly on which metrics are most suitable for their circumstances. Programs with mandatory indicator datasets for reporting to funders (e.g. Appendix 5), combined with locally developed indicators, may be the most effective means of striking a balance between top-down and bottom-up mechanisms for measuring quality. The ability to have flexibly implemented quality indicator programs relies on advanced information management systems and strong provider engagement. This again underscores the importance of investment in infrastructure upgrades and change-management processes to support the meaningful use of EHR systems.

Although patient experience measures are critical for ACO reporting, the baseline scores on these measures were extremely high in the literature and therefore may have reduced utility in gauging performance improvements. Few ACO models were routinely recording patient-reported outcome measures and this is likely to be an important area for future indicator development.

Applicability

There is no single ACO model for success. This Evidence Check highlights that attention to the local context is essential to the implementation of these models. ACOs bring together several elements of integrated care, underpinned by a financial incentive model that serves to move health systems away from volume to value-driven services. To this extent these models are likely to be just one of many system nudges to achieve a higher performing health system.

McClellan suggests there are four 'no-regret' principles that policy makers should adhere to when transitioning to accountable care for populations: (1) take a broader perspective than illness; (2) start to pay for outcomes; (3) create a favourable environment for organisations to collaborate; and (4) encourage interoperable data systems.⁴⁹ At both federal and state levels there are several policy shifts that signal alignment with these principles. In particular, the NSW Health Integrated Care Strategy demonstrators and innovators projects have made substantial inroads into supporting this shift. More recently, the Australian Health Care Homes (HCH) trial is investing in primary care reform and at a local level several Primary Health Networks (PHNs) are innovating in this area. The ACI Navigating the Healthcare Neighbourhood program is seeking to capitalise on these primary care reforms to increase collaboration between organisations. These initiatives have many similarities with ACO models. Table 3 highlights some of the similarities and differences between the NSW Integrated Care Strategy, HCHs and ACOs.

Table 3: Comparison of NSW Integrated Care Strategy, Health Care Homes and ACOs

Domain	NSW Integrated Care Strategy*	National Health Care Homes (HCH) trial	ACOs
Population	Partially disease-focused — many local initiatives focus on specific populations	Mainly focused on people with chronic and complex care	Generally not disease-focused
	Large size (>300,000) but specific initiatives target smaller subgroups	Small practice-level populations (<5000 people)	Small to medium size (10,000 to 100,000)
	Patient population tends to be drawn from LHD/PHN region but not exclusively region-based	Patient population determined by practice	Mixed patient populations ranging from regional all-in models through to attributed beneficiaries based on claims data
	Some specific initiatives to target under-served populations	No specific initiatives to target under-served populations although Aboriginal Community Controlled Services are actively participating	Some ACOs exclusively target under-served populations
	Patient engagement varies depending on local programs	Voluntary patient enrolment	Usually no patient enrolment
	Providers mainly opt in to specific initiatives	Providers opt in	Providers opt in with successful models achieving high engagement (>80%)

Performance outcomes	Quality and experience reported mainly at LHD/ PHN level by some LHDs/PHNs	Quality reported at PHN level (for reporting purposes to the funder) and may be reported at practice level for quality improvement purposes	Quality, experience, costs generally reported internally at provider, practice and ACO levels
	No public reporting	Program performance data likely to be publicly reported	Public reporting at ACO level common
	Some limited cost-effectiveness evaluations conducted. Ministry of Health program evaluation will report on cost-effectiveness	Cost-effectiveness evaluation of program will be conducted	Cost analyses integral to ACO model. Independent economic evaluations less common
	Patient-reported outcome measures not included in majority of initiatives	Patient-reported outcomes are being included	Only a minority of ACOs are currently including patient-reported outcomes
Metrics and learning	Data aggregated and reported at LHD/PHN level in one region but not in most other areas	PHNs using dashboards for aggregated data analysis, provider feedback and promotion of quality improvement activities. Providers have access to EHR auditing tools	ACOs use dashboards, real-time provider feedback and quality improvement action cycles. Providers have access to EHR auditing tools
	Local initiatives using data feedback and quality improvement action cycles Strong investment in enhancing hospital-sector information systems and interoperability with ambulatory care	Providers encouraged to participate in quality improvement activities Learning collaboratives not explicitly part of HCH but collaborative programs are concurrently being conducted by many PHNs	Learning collaboratives underpin most successful models
	Investment in shared electronic health records, interoperability with national My Health Record and primary care and hospital data linkage	My Health Record promoted	Patient portals and access to EHR available in some ACOs
Payment and incentives	Large initial investment to three demonstrator sites plus investments of varying amounts for innovation site and previous investment via the NSW Chronic Disease Management Program	PHNs provide infrastructure support to assist provider engagement	Both external and internal ACO stimulus funding common to support initial formation and investment in core infrastructure capabilities
	Co-commissioning of services with PHNs in certain initiatives (not common)	Co-commissioning of services with LHDs in certain initiatives (not common)	Commissioning of services common

	Both participation incentives and outcome-based incentives being implemented in some sites	<p>Bundled, complexity payment for selected Medicare services is intended to be budget-neutral</p> <p>No specific provider incentives based on outcomes</p> <p>Primary care services remain predominantly fee-for-service for those not participating in the HCH trial</p>	<p>Shared savings arrangement with payer and potential financial penalties for cost overruns</p> <p>Distribution of shared savings at discretion of ACO but generally bulk goes back to providers</p> <p>ACO provides additional incentives to providers to participate in quality improvement activities</p> <p>Providers continue to operate in predominantly fee-for-service environment with a few ACOs moving to global population based payments</p>
Coordinated care	<p>Large investment in care-coordination initiatives</p> <p>Some models engaging community and social service providers, e.g. through health alliances</p>	<p>Mainly relies on use of general practice staff to provide care coordination</p> <p>Some LHD/PHN investment through commissioning of care coordination services but not specific to HCH trial</p> <p>Some models seeking to engage community and social service providers</p>	<p>Large investment in care-coordination initiatives</p> <p>Emerging models seeking to include community and social service providers under ACO arrangements</p>

* This summary of the Integrated Care Strategy emphasises activities conducted to date. It is also important to note that each LHD/PHN region adopts a locally specific model and therefore variation in implementation is expected.

Table 3 highlights a substantial overlap between the three strategies; a core element to all, however, is the strengthening of the primary healthcare system and improving the interface between hospital, specialty and primary health care. When considered in the context of Bodenheimer's 10 building blocks for high-performing primary care⁵⁰, the NSW health system is clearly making strong investments in most of these areas (Figure 7).

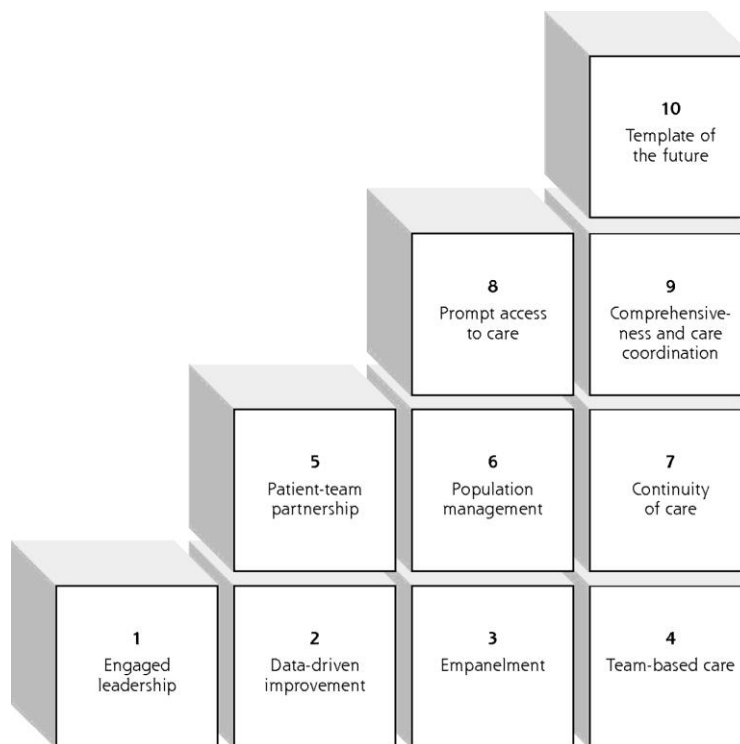


Figure 7 — Ten building blocks of high-performing primary care⁵⁰

Bodenheimer describes payment reform as central to achievement of the 10th building block ('Template of the future') and perhaps it is this area where less investment has been made to date in Australia. A fundamental question, therefore, for both state and federal policy makers is to what extent the financial levers underpinning ACO-like models might accelerate progress to achieving a higher performing system.

Considerations for ACO adoption in NSW

Drawing on the insights from this Evidence Check, we outline several considerations for how such levers might be incorporated into existing system reform initiatives.

1. ACOs are meso-tier entities with accountability to both payers (federal, state and private sector) and the communities they serve. Given the existing regional boundary alignment between LHDs and PHNs and emerging interest in co-commissioning of services, it is essential that these two sectors play a lead role in determining how to adopt ACO models into their existing practice. An explicit commitment to improving health system performance for Aboriginal and Torres Strait Islander communities would also be desirable and the state affiliate bodies of the Aboriginal Community Controlled Health Services could also play a central role in establishing an ACO model. Integration of social service providers and other private-sector organisations could also be considered at a later stage of maturity.
2. To support ACO model adoption in the Australian context, it is likely multi-payer agreements would be needed in which state, federal and private payers aligned their provider reimbursement strategies to allow ACOs to take responsibility for total costs of care for a defined population. To encourage adoption of ACO models, a waiver of risk sharing agreements would also likely be needed in the early stages of formation. Efforts could then be directed to conducting essential work to develop appropriate cost and quality indicators and their reporting. Over time, successful models could potentially transition to a one-sided risk model in which any savings incurred would be shared between payers and the ACO and no penalties would be incurred for cost-overruns. Careful preparatory work would be needed to determine acceptable expenditure benchmarks and risk-adjustment methods.
3. The evidence synthesis suggests ACOs are best considered as social enterprises, taking a start-up mentality to their formulation. Such a mindset stimulates 'ground-up' innovation, with payers playing a core role in providing protection from financial risk until the ACO achieves sustainability. Leadership and organisational design are critical in driving successful enterprises. Leadership structures need to

promote shared values through all layers of the organisation with particular attention to local physician and citizen engagement. Organisational design that stimulates new possibilities while optimally executing existing strategies is key to determining the level of entrepreneurship adopted by an organisation.¹ To nurture innovation, ACOs should also have wide discretion on how they engage service providers to improve healthcare outcomes. This would include flexibility in what services are commissioned, the provision of support staff for care coordination, reporting mechanisms, development of quality improvement strategies and provision of financial incentives to providers. Providers in turn need flexibility in how they participate in the model and, although additional support may be provided to move towards population-based payment models, there may not be a need to make a substantive shift from fee-for-service reimbursement.

4. In terms of size, structure and outcomes, we propose a 'rule of ones' — 100,000 population, 100 providers, 10-year contracts, 10% of provider income from incentives with the goal of achieving an intermediate-term 10% improvement in quality measures (over 3–5 years), and 10% savings on risk-adjusted, 10-year projected expenditure. Clearly, there needs to be flexibility in these estimates; however, the implication of this proposed size is that there would be more than one ACO model operating in each LHD/PHN region. The population serviced could be sub-segmented into those with high healthcare needs and those of lower need. Locally validated risk stratification tools could play an important role in determining priority population groups.
5. Careful consideration also needs to be given to how people are assigned to an ACO. Consent processes with opt-in or opt-out models are appealing to ensure community participation; however, there is a danger of risk selection, with people who could most benefit from such a model excluded from accessing those benefits. Consent models also require considerable administration support. A regional 'all-in' model can mitigate these issues, although it has the risk of excluding community participation and has to address changes in the population in a defined area. Some mandatory requirements such as citizen boards could help address these issues.
6. To establish optimal models, considerable technical preparatory work is needed in three principal areas: (1) Costing — conduct economic modelling to determine expenditure benchmarks, cost calculation scenarios and reporting mechanisms; (2) population attribution — conduct analyses to clarify the issues highlighted above; (3) quality indicators — conduct analyses and consultation processes to develop a minimum dataset of measurable indicators that included a mix of health, process and experience measures, with careful attention to potential unintended consequences from encouraging certain indicators at the expense of other aspects of care.
7. A collaborative learning network also appears to be an essential enabler, providing a range of support functions and serving as a platform for sharing knowledge. This network would play an integration support role. Drawing on Valentijn's conceptual framework on the integrative functions of primary care, this would include support with: (1) system integration (alignment of rules and policies within a system); (2) organisational integration (enabling the coordination of services across different organisations); (3) professional integration (enabling professionals to coordinate services across various disciplines); (4) clinical integration (care service coordination); (5) functional integration (provision of back-office and support functions); and (6) normative integration (promotion of shared mission and work values).⁵¹ Four domains that are essential in supporting these integration functions are investment in data analytics, support for the uptake of digital health initiatives, quality and safety programs that build a critical mass of stakeholders with core skills in this area, and business analytics to support sustainable business models. The NSW Clinical Excellence Commission is making considerable investments to build a culture of quality and safety within the NSW health system and many existing activities could be leveraged to support ACO models. There are many additional existing NSW Health initiatives that are active in these domains and consequently the collaborative learning network would not necessarily require a high degree of new investment to support its function. Engagement with international networks in accountable care models would also be desirable to provide a forum for sharing learnings and gaining a better understanding of best practice implementation models.
8. Finally, it is essential to implement robust, independent monitoring and evaluation processes. The relatively immature evidence base for accountable care and the paucity of rigorous evaluations are major barriers to advancing knowledge in this area. Such evaluations are inherently complex and would require close attention to the development of appropriate logic models, measurement of inputs,

¹ For a discussion of this see Simons R, 2013 "The Entrepreneurial Gap: How Managers Adjust Span of Accountability and Span of Control to Implement Business Strategy Harvard Business Review: [Working Paper 13–100](#)

activities and outputs, and most likely a mixed methods approach combining quantitative and qualitative methods to assess short, intermediate and long-term impact.

Conclusion

Accountable care models are emerging internationally as strategies for fostering a high-performing health system. They should be seen as a continuum of approaches that build on many initiatives to promote integrated care across the health system. This Evidence Check highlights a large amount of activity in the development of accountable care models, particularly in the US, Britain and Europe. However, evaluations of these models are early in their evolution and the current literature is dominated by low-quality studies. Data from national programs and more robust independent evaluations reveal a mixed picture. While there are many examples of ACOs achieving positive performance outcomes across a variety of domains, there are also many that are not making improvements. Analysis of the in-depth case studies included in this report highlights the importance of several implementation factors that appear central to driving success. In terms of applicability to the NSW health system, many of these implementation factors align closely with existing initiatives, particularly the NSW Health Integrated Care Strategy and medical home models. Despite the immature evidence base, we conclude that incorporating accountable care elements into existing and emerging NSW models is worth pursuing. Several conceptual factors are discussed in this report to stimulate discussion on how ACO models could be implemented in NSW.

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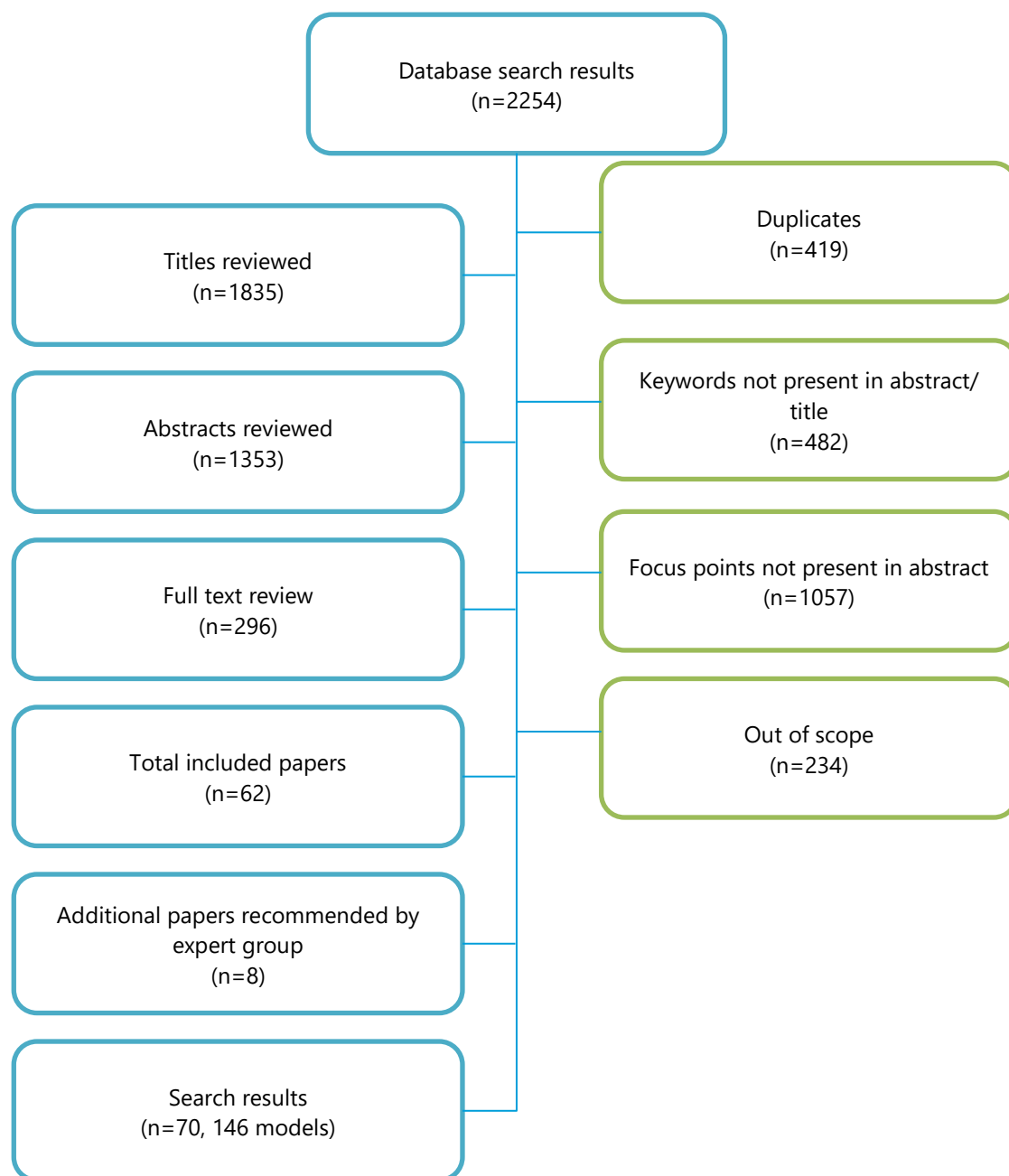
Appendices

Appendix 1 — Database search terms

Search Strategy:

- 1 Accountable Care Organizations/ Organisations or accountable care.mp. (1586)
-accountable, accountable care, accountable care organisations, accountable care organizations, care, accountable health communities.
- 2 Risk Sharing, Financial/ or risk sharing.mp. (1132)
-risk, risk sharing, sharing, capitation fee, cost sharing.
- 3 "Delivery of Health Care, Integrated"/ (10621)
-delivery of health care, integrated, care delivery, health care reform.
- 4 "Quality of Health Care"/ (66552)
-quality of health care, quality of care, guideline adherence, quality assurance, quality indicators, quality improvement, benchmarking, standards of care, value, value-based.
- 5 "Outcome and Process Assessment (Health Care)"/ (25160)
-outcome assessment (Healthcare), process assessment (Healthcare).
- 6 cost sharing.mp. (2989)
- 7 models of care.mp. (1971)
- 8 delivery of care.mp. (2529)
- 9 capitation fee.mp. (4210)
- 10 1 or 2 or 6 (5616)
- 11 7 or 8 (4483)
- 12 1 and 11 (37)
- 13 3 and 9 (187)
- 14 4 or 5 (90253)
- 15 10 and 14 (423)
- 16 1 or 12 or 13 or 15 (1958)

Appendix 2 — Flow chart of articles retrieved



Appendix 3 — Included studies for review questions 1 and 2

Model	Author Year	Title	Country	Purpose	Description of model	Funder/ commissioner	Healthcare setting	Population	Health professionals who provide the service	Scope	Study design	Outcome — health outcomes	Outcome — patient experience	Outcome — costs	Implementation barriers/enablers described? Yes/ No
Accountable Health Community Model — see spreadsheet for models A, B ⁵²	DE Alley, CN Asomugha, PH Conway and DM Sanghavi 2016	Accountable Health Communities —Addressing Social Needs through Medicare and Medicaid	US	Assess whether systematically identifying and addressing health-related social needs can reduce healthcare costs & utilisation among community-dwelling Medicare & Medicaid beneficiaries	3 'tracks' implemented over 5 years — 1. Awareness: screening and referral only; 2. Assistance: screening, referral, plus community service navigation; 3. Alignment: screening, referral, community service navigation, plus partner alignment	CMS Innovation Center & Centers for Medicare and Medicaid Services (CMS)	Primary and outpatient	Wider community	Physicians and health professionals	Health and social care	Review	Not described	Not described	Not described	Y
Super ACO models — see spreadsheet for models A–D ⁴⁸	DG Anderson and DE Morris 2015	Characteristics of successful 'super ACOs'	US	Not described	Aim to maintain local character of independent hospitals while meeting cost and quality requirements	N/A	Hospital	Wider community	Physicians and health professionals	Health and integrated care	Review	Not described	Not described	Not described	N
Pioneer ACO model ⁵³	RD Anderson, E Aderholdt, N Chenven, M Duncan, N Haywood, M James, et al 2012	Ascension Health partners with Centers for Medicare and Medicaid Services to provide patient-centered care through the Pioneer Accountable Care Organization model.	US	Develop systems in which healthcare professionals who are not necessarily employed by Ascension Health hospitals engage with organisations in population health strategies that include financial risk-taking	Two-sided risk-based reimbursement model with a population-based payment approach	Ascension Health, Seton Health Alliance, Genesys PHO	Hospital and primary care	Wider community	Physicians and health professionals	Health and integrated care	Case study	Not described	Not described	Not described	N
Multiple models — see spreadsheet for	C Baan, H Drewes, R Heijink, J Struijs 2016	Affordable and accountable care: the continuum of prevention-care and welfare	The Netherlands	Simultaneously improve quality of care, improve the population's health and reduce per capita costs (Vektis)	Collaboration between healthcare providers, insurers and stakeholders, such as municipalities and citizen representatives, work	National Institute for Public Health & Environment (RIVM), and the	Primary care	Wider community	Healthcare providers and insurers	Health and integrated care	Review	Not described	Not described	Not described	Y

models A– J ⁵⁴		within nine Dutch population management sites			jointly together to achieve sustainable care	Dutch Ministry for Health									
Shared-savings model ⁵⁵	M Bailit and C Hughes 2011	Key design elements of shared-savings payment arrangements	US	Payment strategy that offers incentives for providers to reduce healthcare spending for a defined patient population by offering them a percentage of net savings realised as a result of their efforts	Payment strategy that offers incentives for providers to reduce healthcare spending for a defined patient population by offering them a percentage of net savings realised as a result of their efforts	Bailit Health Purchasing	Primary	Wider community	Healthcare providers and insurers	Health and integrated care	Issue brief	Not described	Not described	Not described	N
Multiple models — see spreadsheet for models *A,B,C ⁵⁶	AJ Barnes, L Unruh, A Chukmaiov and E van Ginneken 2014	Accountable care organizations in the USA: types, developments and challenges	US	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
Team-based care model ⁵⁷	LL Berry and D Beckham 2014	Team-based care at Mayo Clinic: a model for ACOs	US	Deliver US healthcare effectively and efficiently by promoting collaborative, coordinated care across multiple providers and organisations	Teamwork is classified as the 'unshakeable cultural priority', with the recognition that there is an embedded, resistant nature of established patterns of behaviour in healthcare. To achieve improved care and service and reduce costs, ACOs need to acknowledge that integrated care requires, above all else, genuine teamwork	Mayo Clinic Health System	Primary and hospital	Health professionals	Physicians and health professionals	Health and integrated care	Case study	Not described	Not described	Not described	N
Minnesota's Hennepin Health model ⁷	LA Blewett and RA Owen 2015	Accountable care for the poor and underserved: Minnesota's Hennepin Health model	US	Provide integrated medical and social services to low-income Medicaid patients in a large county located in Minneapolis, Minnesota	Hennepin Health is an ACO made up of 4 county-affiliated organisations that jointly contract with the Minnesota Department of Human Services to provide Medicaid and social services to a population of 8700 members with incomes below 133% of the federal poverty level. Medicaid pays the ACO	Hennepin County Human Services and Public Health Department, Hennepin County Medical Center, Metropolitan Health Plan (a county-operated not-for-profit health	Primary and hospital	Poor and underserved communities	Physicians and health professionals	Health and social care	Review	2012–13: Outpatient clinic visits per 1000 member months +3.3% change; emergency department visits - 9.1% change; inpatient	Increasing rates of quality for patients with diabetes, asthma and vascular conditions, and 87% of patients indicated satisfaction with their	Not described	Y

					on a per-member per-month basis, and partners share in all gains and losses associated with the program. The 4 organisations provide a range of health, mental health, social services and claims processing services	maintenance organisation), and NorthPoint Health & Wellness Center						admissions -3% change	care experience		
Brookings–Dartmouth ACO Pilot Program–Monarch HealthCare ^{5 8}	K. Carluzzo, BK Larson, AD Van Citters, SA Kreindler, FM Wu, EC Nelson, SM Shortell and ES Fisher 2012	Monarch HealthCare: Leveraging Expertise in Population Health Management	US	1) To create the capabilities to be accountable for the quality and cost of care received by its patient population; and 2) to develop an accountable care organization (ACO) contract with Anthem for this global quality/cost payment model	Core characteristics: 1. The payer-partner (Anthem); 2. Legal entity (entity within existing parent organisation); 3. Oversight of ACO formation (steering committee), 4. Payment model (shared saving with no risk in 1 year; transition to risk-bearing); 5. Patient attribution model (Anthem Episode Treatment Group); 6. ACO patient population (25,000), 7. ACO physician population (500, not currently assigning patients to specialists)	Monarch HealthCare and Anthem preferred provider organisation (PPO), both managed by independent executive steering committees	Primary	Wider community	Physician-led	Health and integrated care	Case study	Not described	Not described	Not described	Y
Aetna Medicare Advantage ⁹	TF Claffey, JV Agostini, EN Collet, L Reisman and R Krakauer 2012	Payer-provider collaboration in accountable care reduced use and improved quality in Maine Medicare Advantage plan	US	The purpose of this case study is to describe how a provider organisation and a health plan can align their goals and incentives, implement a clinical plan to achieve these goals, and assess the impact on clinical quality and efficiency	Independent physician association in Portland, Maine, with 50 primary care physicians, 32 specialist physicians, and 14 nurse practitioners and physician assistants. The practice has 65,000 patients, each of whom has a primary care physician, and offers ancillary and urgent care services	Aetna and NovaHealth	Primary and hospital	Wider community with specialised components for patients such as those with advanced illnesses	Physician-led	Health and Integrated care	Case study	Not described	Not described	Not described	Y
Adjustable Provider Payment Model *A, B, C, D, E ⁶⁰	DA Conrad, D Grembowski, SE Hernandez, B Lau and M Marcus-Smith	Emerging lessons from regional and state innovation in value-based payment reform:	US	Not described	Value-based, multi-stakeholder payment reform project across 6 states and 3 regions of the US	The Robert Wood Johnson Foundation	Primary	Not described	Physicians and health professionals	Health and integrated care	Case study	Not described	Not described	Not described	N

	2014	balancing collaboration and disruptive innovation													
Multiple models — see spreadsheet for models ²³	E Nolte, A Frolich, H Hildebrandt, A Pimperl, GJ Schulpen and H JM Vrijhoef 2016	Implementing Integrated Care: A Synthesis of Experiences in Three European Countries	Denmark	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
Accountable Care Implementation Collaborative/ Premier healthcare alliance ACO model ⁶¹	S Devore and RW Champion 2011	Driving population health through accountable care organizations	US	Not described	Not described	Not described	Primary	Not described	Not described	Health and integrated care	Case study	Not described	Not described	Not described	N
Multiple models — see spreadsheet for models *A,B,C ⁶²	BD Fulton, V Pegany, B Keolanui and RM Scheffler 2015	Growth of Accountable Care Organizations in California: Number, Characteristics, and State Regulation	US	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
Complex care management (CCM) program *A-R ⁸	CS Hong, AL Siegel and TG Ferris 2014	Caring for high-need, high-cost patients: what makes for a successful care management program?	US	The study compared the operational approaches of 18 successful complex care management programs in order to offer guidance to providers, payers and policy makers on best practices for complex care management	Not described	Centers for Medicare & Medicaid services (CMS)	Primary and acute	18 sites successfully implementing an advanced care model	Physicians and health professionals	Health & Integrated care	Review and semi-structured interviews	It was found that effective programs customise their approach to their local contexts and caseloads; use a combination of qualitative and quantitative methods to identify	Not described	Not described	N

												patients; consider care coordination on one of their key roles; focus on building trusting relationships with patients as well as their primary care providers; match team composition and interventions to patient needs; offer specialised training for team members; and use technology to bolster their efforts			
State Innovation Models (Sim) Initiative ⁶³	S. Silow-Carroll and J Lamphere 2013	State innovation models: early experiences and challenges of an initiative to advance broad health system reform	US	Reveal the readiness of providers and payers to adopt innovations varies, requiring different starting points, goals, and strategies by building on past reform efforts; redesigning health information technology to provide reliable, targeted data on care costs and	CMS has awarded nearly US\$300 million to 25 states to design and launch State Health Care Innovation Plans. Grantees include six 'model-testing' states, which are moving ahead with their plans; three 'model-pretesting' states, which are continuing to design their plans; and 16 'model-design' states, which are creating their plans. The six model-	The Innovation Center of the Centers for Medicare & Medicaid Services (CMS)	Primary and acute	Chronic conditions & Hospital admissions	Physicians and health professionals	Health, social care and integrated care	Issue brief	Not described	Not described	Not described	Y

				quality; and using standard performance measures and financial incentives to spur alignment of providers' and payers' goals	testing states receive US\$33 million to US\$45 million over 42 months to implement their plans. The three pretesting states receive US\$1 million to US\$2 million over six months to refine their plans. The 16 model-design states receive US\$1 million to US\$3 million over six months to develop their plans. CMS expects model-design states to apply for an anticipated second round of awards for testing their models										
Robert Wood Johnson Medical School ACO model ⁶⁴	AF Tallia and J Howard 2012	An academic health center sees both challenges and enabling forces as it creates an accountable care organization	US	Provide a structural solution to the primary care provider shortage by aligning primary care with hospitals, specialty physicians and other healthcare providers	Not described	The University of Medicine and Dentistry of New Jersey, the Robert Wood Johnson Medical School	Primary	Chronic conditions and hospital admissions	Physicians and health professionals	Health and integrated care	Evaluation	Not described	Not described	Not described	Y
Genesys PHO Michigan 'Pioneer ACO model' ⁶⁵	MH James 2012	Navigating the road ahead: lessons from a pioneer ACO	US	Genesys PHO is a collaborative arrangement between Genesys Health System and 160 primary care physicians who deliver healthcare services in Flint and the surrounding area	Priority is a physician-patient relationship to produce high-quality care, physicians operating with a collaborative mindset. To offer a system of follow-up services to patients with chronic conditions and to restore trust between physicians and patients	Centers for Medicare & Medicaid Services (CMS)	Primary	Chronic conditions	Physicians and health professionals	Health, social care and integrated care	Case study	Not described	Not described	Not described	N
Two models — see spreadsheet for models A and B ⁹	E Kessell, V Pegany, B Keolanui, BD Fulton, RM Scheffler and SM Shortell 2015	Review of Medicare, Medicaid, and Commercial Quality of Care Measures: Considerations for Assessing Accountable Care Organizations	US	Multiple models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Two models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
Atlantic ACO ⁶⁶	C Koury, L Iannaccone, A	The accountable care	US	Not available	Atlantic ACO is a physician-led organisation governed by	Valley Hospital & Atlantic Health System	Primary and hospital	Not described	Physicians	Health and	Case study	Not described	Not described	Not described	Y

	Strunk, A Udelson, A Boaz, C Cianci, SK Huszagh and M Keale 2014	organization summit: a white paper on findings, outcomes, and challenges			a 13-member board and comprised of approximately 13,000 physicians, 250 of whom are primary care					integrat ed care					
Zio Integrated Care Network ⁶⁷	Vrijhoef HJM, Huizing AR, Udayakum ar K, Gonzales- Smith J, Kadokia K, Thoumi A 2017	Zio Integrated Care Network	The Netherl ands	Zorg In Ontwikkeling (Zio) is an integrated care network in the Netherlands that organises primary care for patients with non- communicable diseases (NCDs, also known as chronic diseases) through disease-specific bundled payments with downside risk	Integrated primary care group targeting patients with specific NCDs. Built off pilot in 1997, formalised in 2007. 24,500 patients enrolled	Netherlands Organisation for Health Research and Development (ZonMw)	Primary	Patients with non- communicabl e diseases	Physicians and health profession als	Health, social care and integrat ed care	Case study	54% decrease in hospital admission costs for patients assigned to specialty nurses. 15% decrease in proportion of patients with poor glycaemic control	Not described	Not described	Y
Gesundes Kinzigtal ⁶⁷	A Pimperl, H Hildebrand t, O Groene, T Schulte, I Meyer, and M Wetzel 2017	Gesundes Kinzigtal	German y	Gesundes Kinzigtal is a privately run health management company that operates an integrated care system in rural southwest Germany and serves a middle to lower-income population with a high proportion of non-communicable diseases (NCDs, also known as chronic diseases)	Health management company that coordinates multiple types of providers and two insurance funds, covering about 46% of the population (all ages, no exclusions). Initially a 10-year contract (now unlimited) to cover all 33,000 people living in the region that are insured by the two cooperating insurance funds. 10,000 patients are actively enrolled in specific care programs	2 funders	Primary	Middle-low income with high rates of chronic disease	Physicians and health profession als	Health, social care and integrat ed care	Case study	Mean age of death 1.4 years higher than in control group	92% patient satisfaction rate	Financially self- sufficient. From 2007–2014 total savings of ~\$38.2 million (USD 2014). In 2014: €5.5 million (~\$7 million, USD 2014); (7.4%)	Y
Better Together ⁶⁷	A Sullivan, and L Dudge 2017	Better Together	Britain	Mid Nottinghamshire Better Together Health and Social Care (referred to as Better Together) is an alliance of regional providers and stakeholders in	Alliance of integrated primary, acute and social care systems. 1 year. 310,000 catchment size	NHS Five Year Forward View (FYFV)	Primary	Ageing and overweight with chronic disease	Physicians and health profession als	Health, social care and integrat ed care	Case study	Reduced inappropri ate emergency attendanc e by 4%	Not described	Anticipated US\$39 million savings to the health economy by 2018–19	Y

				central England that have integrated primary, acute and social care systems to serve an ageing and overweight population with high rates of non-communicable diseases (NCDs, also known as chronic diseases)											
Multiple Medicare and Medicaid models — see spreadsheet for models A–AB ²¹	SM Shortell, LP Casalino and ES Fisher 2010	How the Center for Medicare and Medicaid innovation should test accountable care organisations	US	Triple aim objectives: lower costs, improved health and improved patient experience	These systems typically have aligned financial incentives, electronic health records, team-based care and resources to support cost-effective care	Not described	Common ownership of hospitals and physicians and in some cases an insurance plan. Primary and hospital	Not described	Physicians	Health and integrated care	Review	Not described	Not described	Not described	N
Early adopters of ACOs. Multiple models — see spreadsheet for models A–G ³¹	S Silow-Carroll and JN Edwards 2013	Early adopters of the accountable care model: A field report on improvements in health care delivery	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Review				
Multiple models — see spreadsheet for models A–E ¹⁷	S Silow-Carroll, JN Edwards and D Rodin 2013	How Colorado, Minnesota, and Vermont are reforming care delivery and payment to improve health and lower costs	US	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
New Jersey Medicaid Accountable Care Organization (ACO) Demonstration Project ⁶⁸	A Skoufalos and K Cecil 2013	The journey to creating safety net accountable care in New Jersey	US	The demonstration was designed to provide an opportunity for communities to explore innovative system redesigns that would allow them to better serve Medicaid recipients, especially those who are high-risk, high-	Medicaid	Not described	Primary, hospital	Whole community	Physicians	Health and integrated care	Qualitative	Not described	Not described	Not described	N

				cost users of healthcare; expand Medicaid to integrate social services into the paradigm; and experiment with payment reform models using pay-for-performance metrics and incentives											
Blue Cross Blue Shield of Massachusetts Alternative Quality Contract (AQC) ²⁷	Z Song, S Rose, DG Safran, BE Landon, MP Day and ME Chernew 2014	Changes in health care spending and quality 4 years into global payment	US	Evaluated spending and quality measures during the first 4 years of the Blue Cross Blue Shield of Massachusetts Alternative Quality Contract (AQC)	The AQC is a two-sided contract with shared savings if spending is below budget and shared risk if spending exceeds the budget (a so-called risk contract)	Not described	Primary and hospital	Whole community	Physicians	Health and integrated care	Quasi-experimental	Improvements in quality among AQC cohorts generally exceeded those seen elsewhere in New England and the US. Outcome quality consisted of the following five measures: control of the glycated haemoglobin level ($\leq 9\%$), control of the low-density lipoprotein (LDL) cholesterol level (< 100 mg per decilitre [2.6 mmol per litre]), and	Not described	In the 2009 AQC cohort, medical spending on claims grew an average of US\$62.21 per enrollee per quarter less than it did in the control cohort over the 4-year period ($P < 0.001$). This amount is equivalent to a 6.8% savings when calculated as a proportion of the average post-AQC spending level in the 2009 AQC cohort. Analogously, the 2010, 2011, and 2012 cohorts had average savings of 8.8% ($P < 0.001$), 9.1% ($P < 0.001$), and 5.8% ($P = 0.04$), respectively, by the end of 2012. Claims savings were concentrated in the outpatient-	N

												blood-pressure control (<140/80 mm Hg) in patients with diabetes; the same level of control of LDL cholesterol in patients with coronary artery disease; and a blood-pressure control level of 140/90 mm Hg in patients with hypertension		facility setting and in procedures, imaging, and tests, explained by both reduced prices and reduced utilisation. Claims savings were exceeded by incentive payments to providers during the period from 2009 to 2011 but exceeded incentive payments in 2012, generating net savings	
The Virginia Cardiac Surgery Quality Initiative ⁶⁹	AM Speir, JB Rich, I Crosby and E Fonner Jr 2009	Regional collaboration as a model for fostering accountability and transforming health care	US	The common goal is to improve clinical quality across Virginia in heart surgery programs through outcomes analysis and process improvements	17 hospitals and 13 cardiac surgical practices providing open-heart surgery and performing more than 99% of the state's open-heart procedures	Not described	Membership includes 2 academic medical centres, hospitals affiliated with 2 regionally integrated delivery systems, 2 multi-hospital systems (1 for-profit and 1 with religious sponsorship), and several regional medical centres and	Cardiology	Physicians	Health and integrated care	Case study	Not described	Not described	Not described	N

Crystal Run Healthcare ³⁵	G Spencer 2014	Making the move to an ACO	US	Triple Aim objectives: lower costs, improved health and improved patient experience	ACO under the Medical Shared Savings Program	Not described	freestanding facilities Primary and hospital	Low-to-moderate-income elderly patients	Physicians	Health and integrated care	Case study	An embedded care manager program at one local hospital decreased the 30-day all-cause readmission rate for Crystal Run patients at the hospital by 8%. Through the ACO, Crystal Run also has reduced the cost of care for its diabetic population by 15% while improving quality metrics for other at-risk populations	Not described	Not described	N
ChenMed ¹¹	C Tanio and C Chen 2013	Innovations at Miami practice show promise for treating high-risk Medicare patients	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Patients with five or more chronic conditions drive most Medicare costs. ChenMed developed a scalable primary care-led delivery model that focuses on this population while getting reimbursed through full-risk capitation by Medicare Advantage plans. ChenMed is a	Not described	Primary	Not described	Physicians	Health and integrated care	Case study	ChenMed Medicare patients have substantially lower rates of hospital use than their peers in the Miami	Improved patient medication adherence, increased the time doctors and patients spend together, and led to high rates of	Not described	N

					primary care–led group practice based in Florida that serves low-to-moderate-income elderly patients, largely through the Medicare Advantage program. The model includes a number of innovations: a one-stop shop approach for delivering multi-specialty services in the community, smaller physician panel sizes of 350–450 patients that allow for intensive health coaching and preventive care, on-site physician pharmacy dispensing, a collaborative physician culture with peer review, and customised information technology							Medicare market	patient satisfaction		
Partners HealthCare Pioneer ACO ⁷⁰	CE Milford and TG Ferris 2012	A modified 'golden rule' for health care organizations	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Pioneer ACO	Not described	Primary and hospital	2 large academic medical centres — Massachusetts General Hospital and Brigham and Women's Hospital — with more than 6000 physicians, including more than 1200 primary care physicians	Physicians	Health and integrated care	Review	Not described	Not described	Not described	N
Multiple models — see spreadsheet for models *A,B ³⁴	R Tipirneni, KD Vickery and EP Ehlinger 2015	Accountable Communities for Health: Moving from Providing Accountable Care to Creating Health	US	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
Gesundheit snetz Qualitat	V Wambach	[Healthcare networks in Germany:	Germany	To increase the quality and the efficiency of care	Outpatient physician-led organisation	Not described	Outpatient	Not described	Physicians	Health and	Case study	Percentage of enrolled	Not described	Margin (=risk-adjusted expected costs	N

und Effizienz (QuE; Health Quality and Efficiency Network) in Nuremberg ²⁶	and J Lindenthal 2015	status quo and key success factors]		and patient satisfaction by improving the collaboration and communication between physicians and other healthcare providers						integrat ed care		patients with diabetes type II, who achieved their individuall y agreed-upon glycated haemoglo bin or HbA1C value: QuE = 83.7% vs. average in the German state Bayern = 60.6%)		calculated via the German Morbidity Adjusted Risk Equalisation Scheme — real costs of the enrolled patients) for the enrolled patients improved from -146€ in the year before their start (2006) to +128€ (2012)	
The Accountabl e Care Coalition of Eastern North Carolina (MSSP) ⁷¹	KA Willis 2016	Challenges and Pitfalls of Operating a Rural Accountable Care Organization	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Medicare Shared Savings Program (MSSP)	Not described	Not described	Not described	Physicians	Health and integrat ed care	Case study	Dramatical ly lowered rates of preventabl e admissions and readmissio ns	Given the slim possibility of achieving shared savings, the financial partner chose to withdraw their participation, and a notice of termination was provided to CMS	Not described	Y
Multiple models — see spreadshee t for models *A, B ¹²	R Busse and J Stahl 2014	Integrated care experiences and outcomes in Germany, the Netherlands, and England	Multiple models — see spreads heet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreads heet for details	Multiple models — see spreads heet for details	Multiple models — see spreads heet for details	Multiple models — see spreads heet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreads heet for details
Tucson Medical Center (Brookings–Dartmouth	KL Carluzzo, BK Larson, AD Van Citters, SA Kreindler,	Tucson Medical Center: A Community Hospital Aligning Stakeholders	US	Triple Aim objectives: lower costs, improved health and improved patient experience	The ACO will initially include two distinct patient populations covered by United Healthcare: approximately 8000	Insurer United Healthcare. A new legal entity, Southern Arizona Accountable	Primary and hospital	Not described	Physicians	Health and integrat ed care	Case study	Not described	Not described	Not described	N

ACO Pilot Program) ⁷²	EC Nelson, SM Shortell and ES Fisher 2012	for Accountable Care			Medicare Advantage beneficiaries and 23,000 commercial preferred provider organisation (PPO) members	Care Organization (SAACO), will unite the hospital and physician groups to coordinate care and share savings. Three groups contribute to the development and governance of the ACO: a workgroup, a physician steering committee, and an executive governing board									
Multi-specialty community provider (MCP) and primary and acute care system (PACS) vanguards *A–F ⁷³	B Collins 2016	New care models: Emerging innovations in governance and organisational form	Britain	Consolidating primary care in larger groupings, often within neighbourhood clusters, so they can deliver a broader range of services out of hospital and work more effectively with other parts of the system. They are all building closer partnerships between primary, community, mental health and social care services as a basis for changing how staff and resources are used. And they are all building partnerships between the primary and community system and local hospitals	MCP: groups of GP practices come together to offer a broader range of services, including community and outpatient services. PACS: a single entity takes responsibility for delivering the full range of primary, community, mental health and hospital services, to improve co-ordination and move care out of hospital	Not described	Not described	Not described	Physicians	Health and integrated care	Case study	Not described	Not described	Not described	N

Multiple models — see spreadsheet for models *A, B ⁷⁴	JN Gbemudu, BK Larson, AD Van Citters, SA Kreindler, FM Wu, EC Nelson, SM Shortell and ES Fisher 2012	HealthCare Partners: Building on a Foundation of Global Risk Management to Achieve Accountable Care	US	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details				
Gesundes Kinzigtal ⁷⁵	H Hildebrandt, T Schulte and B Stunder 2012	Triple Aim in Kinzigtal, Germany: Improving population health, integrating health care and reducing costs of care — lessons for the UK?	Germany	Triple Aim objectives: lower costs, improved health and improved patient experience	Starting in 2006, Gesundes Kinzigtal GmbH had a 10-year contract for the total healthcare service budget for all 31,000 people insured by AOK BW and LKK BW in the Kinzigtal region. Upside accountability. The company was not penalised financially for a loss, but was rewarded for a relative gain. Gesundes Kinzigtal GmbH was financially accountable for all members of the two sickness funds (not just those patients who participated in the project or who were being treated by the partnering physicians). Key features: individual treatment plans and goal-setting agreements between doctor and patient, enhancing patient self-management and shared decision-making (SDM); chronic care model (Wagner et al, 2001); patient coaching and follow-up care; right care at the right time; system-wide electronic patient record. The intervention included about 20	Regional health management company in cooperation with the local physicians' network, a German healthcare management company with a background in medical sociology and health economics, and with two statutory health insurers. Shared savings contract between the management company and the health insurers AOK BW and LKK BW	Primary, hospital	Whole community	23 general practitioners, 5 paediatricians, 5 psychotherapists, 24 specialists, 6 hospitals, 11 nursing homes, 4 ambulatory home health agencies, 7 physiotherapists, 1 psycho-social agency	Health, integrated	Case study	The prevalence of patients with fractures among all patients with osteoporosis was about 5% lower in the Kinzigtal group compared with the controls; a higher number of patients in the intervention group were still alive eight quarters after commencement of the programme (89% intervention to 80% matched pair)	Not described	Average overall costs were estimated on basis of insured days. The overall costs contain costs of all relevant sectors — inpatient and outpatient costs, costs for medical treatment, other healthcare costs and sick benefits. Again the intervention group showed a positive trend	N

					preventive and health promotion programs for specific conditions										
Rural ACOs ⁷⁶	Rural Health Informatics Global 2017	Examples of Rural ACOs	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details					
Live Well, San Diego! ⁷⁷	J Zigmond 2013	Caring for the community; Regional programs taking concept ACOs to a much broader level	US	Accountable care community	Relies on involvement from a variety of players other than healthcare providers —including schools, businesses, law-enforcement agencies and faith-based organisations — to improve the health of the county's population of more than 3 million people	Macchione's Health and Human Services Agency	Community	Whole population	Variety of players other than healthcare providers — including schools, businesses, law-enforcement agencies and faith-based organisations	Health, integrate	Case study	Not described	Not described	Not described	N
Multiple models — see spreadsheet for models *A–E ⁷⁸	M McClellan, J Kent, S Beales, M Macdonne II, A Thoumi, B Shuttleworth and S Cohen 2013	Focusing accountability on the outcomes that matter	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details				
Medicaid models *A, B, C ⁶	Association of State and Territories Health Officials 2013	Accountable Care Organizations and Public Health	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Case study				
Multiple models — see spreadsheet for models *A–C ³	S Russell and E Rowley 2014	Evidence-based review: Accountable Care Organisations	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details

Vanguards (n=50) ⁷⁹	National Health Service 2016	New Care Models: Vanguards developing a blueprint for the future of NHS and care services	Britain	Triple Aim objectives: lower costs, improved health and improved patient experience	There are five vanguard types: •integrated primary and acute care systems — joining up GP, hospital, community and mental health services; •multispecialty community providers — moving specialist care out of hospitals into the community; •enhanced health in care homes — offering older people better, joined-up health, care and rehabilitation services; •urgent and emergency care — new approaches to improve the coordination of services and reduce pressure on A&E departments; •acute care collaborations — linking local hospitals together to improve their clinical and financial viability, reducing variation in care and efficiency	Not described	Primary, hospital	Not described	Not described	Health, integrated	Case study	Not described	Not described	Not described	N
Canterbury, NZ ⁸⁰	N Timmins and C Ham 2013	The quest for integrated health and social care. A case study in Canterbury, New Zealand	New Zealand	Services should enable people to take more responsibility for their own health and wellbeing; as far as possible people should stay well in their own homes and communities; when people need complex care, it should be timely and appropriate	The Canterbury ACO model is about a whole system in which health services work collaboratively to provide care and improve patient flow using pathways of care that are aligned between hospitals and the community, including the private and NGO sectors	Not described	Primary, hospital, community	Whole community	Physicians	Health, integrated, social	Case study	Not described	Not described	Not described	Y
Alzira Model ⁵	PWC UK 2017	Shifting to accountable care: characteristics and capabilities	Spain	Triple Aim objectives: lower costs, improved health and improved patient experience	<ul style="list-style-type: none"> • For patients, it offers quality care that is more human, personalised and comfortable • Patients have easy access to, and short waiting times before seeing well informed surgeons • For staff, there is job 	Not described	Not described	Not described	Physicians	Health, integrated	Case study	34% reduction in hospital readmissions within 3 days; average length of stay	54% reduction in average A&E waiting time; average elective waiting time reduced by 55%; 91%	27% decrease in cost per capita	N

					<p>stability with a salary that incorporates both a fixed element and an incentive bonus. Hard work is rewarded</p> <ul style="list-style-type: none"> • For staff, it provides an opportunity for career development, to become involved in research and an environment where decision-making is well supported using IT • For the commissioner (Valencian Autonomous Region Department of Health), it offers lower than average and relatively predictable operational costs through an annual capitated fee 							reduced by 20%	patient satisfaction		
Multiple models — see spreadsheet for models *A–D ⁸¹	AD Van Citters, BK Larson, KL Carluzzo, JN Gbemudu, SA Kreindler, FM Wu, SM Shortell, EC Nelson, ES Fisher 2012	Four Health Care Organizations' Efforts to Improve Patient Care and Reduce Costs	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details
Alternative Quality Contract (AQC) ³⁷	CL Barry, EA Stuart, JM Donohue, SF Greenfield, E Kouri, K Duckworth, Z Song, RE Mechanic, ME Chernew and HA Huskamp 2015	The Early Impact of the 'Alternative Quality Contract' on Mental Health Service Use and Spending in Massachusetts	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Alternative Quality contract: The AQC pays provider organisations via a risk-adjusted prospective payment for all primary and specialty care provided to a population (that is, the global payment or budget) for a five-year period	Blue Cross Blue Shield of Massachusetts (BCBSMA)	Not described	Not described	Physicians	Health, integrated	Case study	No information is available on how this model affects care for people with mental illnesses. Enrolees in participating organisations were slightly	Not described	Among mental health service users, small declines were detected in total healthcare spending and no change was found in mental health spending	N

												less likely to use mental health services			
Synergy Program ⁸²	H Chung, A Kim, CJ Neighbour, S Cummings, MA O'Grady and D Raum 2013	Early experience of a pilot intervention for patients with depression and chronic medical illness in an urban ACO	US	Triple Aim objectives: lower costs, improved health and improved patient experience	The interventions included collaborative care for depression and chronic conditions; behavioural support, including short-term psychotherapy by a licensed clinical social worker on site or telephonically; off-site nurse care management and psychiatrist consultation through an electronic medical record	Not described	Outpatient centre	Patients with multiple chronic conditions and depression and chronic medical illness	RN accountable care managers (ACMs), licensed clinical social worker, behavioural health manager (BHM) and consultant psychiatrist	Health, integrated	Quasi-experimental	No reductions in mean HbA1c, low-density lipoprotein levels or systolic/diastolic blood pressure found in the overall group	Not described	Not described	Y
Partners for Kids (PFK), Pediatric Medicaid ACO ⁸³	KJ Kelleher, J Cooper, K Deans, P Carr, RJ Brilli, S Allen and W Gardner 2015	Cost saving and quality of care in a pediatric accountable care organization	US	Through a subcontracted arrangement with Ohio's 5 Medicaid managed care (MC) plans, PFK is paid an age- and gender-adjusted capitation fee for each child each month, which when averaged out is the per-member per-month (PMPM) payment for care. PFK is then responsible for managing and reimbursing providers for care	Pediatric ACO	Governance shared equally between Nationwide Children's Hospital in Ohio and representatives of physician primary and specialty practice groups	Physician/hospital organisation	Pediatrics	Physicians	Health, integrated	Observational	Quality of care of children in PFK improved significantly (P < .05) in 2011–2013 vs. 2008–2010 on 5 quality measures (including 2 composite measures) and declined significantly on 3 measures	Not described	PFK reduced the growth in costs compared with fee-for-service (FFS) Medicaid and averaged less than MC Medicaid. This slowing in cost growth was achieved without diminishing the overall quality or outcomes of care	N
Monarch HealthCare (Brookings–Dartmouth ACO Pilot Program) ⁵⁸	K Carluzzo, BK Larson, AD Van Citters, SA Kreindler, FM Wu, EC Nelson, SM Shortell	Monarch HealthCare: Leveraging Expertise in Population Health Management	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Single-payer/single-provider model, with Anthem as its designated payer	Insurer Anthem, governed by an internal executive steering committee and a joint external steering committee with	Primary	Not described	physicians	health	case study	Not described	Not described	Not described	Y

	and ES Fisher 2012					Anthem, ACO is physician-owned and governed									
Pediatric models *A–G ⁸⁴	JM Perrin, E Zimmerman, A Hertz, T Johnson, T Merrill and D Smith 2017	Pediatric Accountable Care Organizations: Insight From Early Adopters	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Pediatric ACO	Medicaid	Primary	Pediatrics	Primary care physicians	Health, integrated	Case study	Not described	Not described	Not described	N
ACO Payment Model ⁸⁵	M McClellan, AN McKethan, JL Lewis, J Roski and ES Fisher 2010	A National Strategy to Put Accountable Care into Practice	US	Implementation issues with enacting ACO policy and a proposed national strategy	ACOs characterised according to levels of sophistication in 3 domains — organisational requirements, performance measures and payment model — multiple examples given	Not described	Primary through to tertiary care	Not described	Not described	Health, integrated	Case study	Not described	Not described	Not described	Y
Oregon's and Colorado's Medicaid Accountable Care Organisation (ACO) models ⁹⁰	KJ McConnell, S Renfro, BK Chan, TH Meath, A Mendelson, D Cohen, J Waxmonsky, D McCarty, N Wallace, RC Lindrooth 2017	Early Performance in Medicaid Accountable Care Organizations: A Comparison of Oregon and Colorado	US	Compare performance outcomes for two Medicaid ACO models in Oregon and Colorado, 2010–2014	Two state-based Medicaid transformation initiatives shifting to value-based care initiatives	Colorado and Oregon state governments	Primary through to tertiary care	Medicaid enrollees (452,371 in Oregon and 330,511 in Colorado, 45% male and all ages (mean age 16.74 years)	Physicians and health professionals	Integrated care including social care	Quasi-experimental	Oregon (-6.28 per 1000 beneficiary -months reduction in ED visits, -15.09 per 1000 reduction in primary care visits, -1.01 admissions per 1000 reduction, modest improvements in 3 of 4 measures of access and 1 of 4 measures of appropriateness of care) when compared	Not described	Expenditure decline in all measures in both states and no difference in overall expenditure between the two states	Y

MSSP ACOs ⁴⁷	JM McWilliams, LA Hatfield, ME Chernew, BE Landon and AL Schwartz 2016	Early Performance of Accountable Care Organizations in Medicare	US	Performance of Medicare Shared Savings Program ACOs 2009–2013	Medicare program — first 3 years no downside risk, accountable on 33 quality measures, historical expenditure benchmarks used per ACO to assess financial performance	US federal government Medicare program	Primary through to tertiary care	Random sample of claims data for Medicare enrollees (over 65 years and those with disabilities) in multiple states	Physicians and health professionals	Integrated care including social care	Quasi-experimental	with Colorado Few differences, 2013 cohort significant reduction in COPD admissions, 2012 cohort improved mammography screening rates, hba1c diabetes testing, retinal examinations and preventive services for diabetics	Not described	US\$144 per beneficiary savings in 2012 cohort compared with control, no difference in expenditure in 2013 cohort. Heterogeneity of effect with physician-run ACOs having greater savings than hospital-integrated groups	N
Medicare ACO ³³	JM McWilliams, BE Landon, ME Chernew and AM Zaslavsky 2014	Changes in Patients' Experiences in Medicare Accountable Care Organizations	US	Patient experience survey analyses of Medicare ACO vs. control group	Medicare ACO programs (32 Pioneer ACOs and 12 Shared Savings Program ACOs)	US federal government Medicare program	Primary through to tertiary care	Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey linked to Medicare claims data for patients in ACOs vs. matched control group 2012–13 (21,463 in ACO vs. 186,846 in control)	Physicians and health professionals	Integrated care including social care	Quasi-experimental	Not described	Response rate only 52.8% so potential respondent bias. Modest but significant improvements in self-reported timeliness of care and primary care physicians being informed about speciality care in ACO group, no difference in other measures (physician	Not stated	Y

													ratings, physician interaction and overall care), rating higher in subgroup with higher chronic conditions and expenditure. Baseline satisfaction scores were high on all measures in both groups		
The Blue Cross Blue Shield (BCBS) of Massachusetts' Alternative Quality Contract (AQC) ⁸⁶	JM McWilliams, BE Landon and ME Chernew 2013	Changes in health care spending and quality for Medicare beneficiaries associated with a commercial ACO contract	US	To determine whether there is a spillover effect for an ACO with commercial contracts to Medicare enrollees	Commercial ACO program called the Alternative Quality Contract	Blue Cross Blue Shield of Massachusetts	Primary through to tertiary care	417,182 person-years of Medicare enrollees associated with the commercial ACO program vs. 1,344,143 person-years of Medicare enrollees not associated with the commercial ACO program	Physicians & Health Professionals	Integrated care including social care	quasi-experimental	Improved LDL cholesterol screening for diabetics and those with coronary heart disease (3.1% and 2.5%) but no improvement in other quality measures	Not described	\$99 per beneficiary per quarter reduction in spending mainly driven by reduced outpatient care costs	Y
Hospital Alliance ACOs ⁸⁷	D Muhlestein, P Gardner, T Merrill, M Petersen and T Tu 2014	A taxonomy of accountable care organizations: Different approaches to achieve the Triple Aim	US	Thought piece to conceptualise the varied types of ACOs into six model types based on an ACO database, survey and interviews	ACOs classified according to level of integration (inpatient and outpatient), differentiation (ambulatory, hospital, advanced care) and centralisation (single or multiple owners); 6 different types identified	Not described	Primary through to tertiary care	Not described	Not described	Not described	Review	Not described	Not described	Not described	Y
The Pioneer Accountable Care Organization	DJ Nyweide, W Lee, TT Cuerton, et al	Association of pioneer accountable care organizations	US	To assess the impact on spending and care satisfaction outcomes for Medicare enrollees in	First federal government ACO model initially involving 32 ACOs, with both upside and downside risk-based	US federal government Medicare program	Primary through to tertiary care	Medicare fee-for-service enrollees in Pioneer ACO	Physicians and health professionals	Integrated care	Quasi-experimental	Not described	Modestly higher satisfaction scores for timeliness of	US\$35.62 lower spending per member per month in ACO mainly driven	N

n (ACO) model ¹³	2015	vs. traditional Medicare fee for service with spending, utilization, and patient experience		the Pioneer ACO programs compared with other Medicare FFS patients	contracts and achieving quality measure benchmarks			programs (675,212 in 2012 and 806,258 in 2013) vs. comparison group (13,203,694 in 2012 and 12,134,154 in 2013) for spending outcomes and for care satisfaction in Pioneer ACO (13,097), for FFS Medicare (116,255) and for Medicare Advantage (203,736)					care: 77.2 (ACO) vs. 71.2 (FFS) vs. 72.7 (MA)	by reduced inpatient spending (but total spending increased in both groups)	
Rural Health Clinics (RHCs) ⁸⁸	J Ortiz, A Bushy, Y Zhou and H Zhang 2013	Accountable care organizations: benefits and barriers as perceived by Rural Health Clinic management	US	Assess rural health clinic managers' perceptions of barriers and enablers to implementing ACO models	General principles of ACO models were assessed	Not described	Rural health clinics	Survey of all RHCs existing in 2011 in Region 4, which encompasses Mississippi, Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee and Kentucky. 90 of 1144 responded (8% response rate)	not described	Not described	quantitative	Not described	Not described	Not described	Y
Medicare model ⁸⁹	PB Ginsburg 2013	Achieving health care cost containment through provider payment	US	To examine the factors that would promote sustainable buy-in from providers and consumers to	No specific model reviewed	Not described	Not described	Not described	Not described	Not described	Not described	Not described	Not described	Not described	Y

		reform that engages patients and providers		engage in payment and quality reform initiatives such as ACOs											
The Pioneer accountable care organization (ACO) model ²⁰	HH Pham, M Cohen and PH Conway 2014	The Pioneer accountable care organization model: improving quality and lowering costs	US	Outcomes in 2nd performance year of Pioneer ACO program	Medicare Pioneer ACO program	US federal government Medicare program	Primary through to tertiary care	Medicare beneficiaries in Pioneer program	Physicians and health professionals	Integrated care	Quantitative	Increased quality scores from 2012 to 2013 (mean score 70.8% vs. 84%) with improvements in 28 of 33 quality measures	Not described	Savings in year 1 and year 2 (US\$87m–US\$128m)	Y
Gesundes Kinzigtal ⁹⁰	A Pimperl, H Hildebrandt, O Groene, T Schulte, I Meyer, M Wetzell, M McClellan, K Udayakumar, J Gonzalez-Smith, K Kadakia, A Thoumi 2017	Gesundes Kinzigtal — A Long-Term Shared Savings Contract to Implement Accountable Care in a Rural Setting	Germany	Case study of an ACO established in Kinzigtal region in Germany	Population-based integrated care organisation (joint venture between provider groups and a healthcare management company) with shared savings arrangements, performance incentives and structural support for providers	Two statutory health insurers including the largest in Southern Germany	Primary through to tertiary care	31,000 of 60,000 people in the region insured by the two insurers. Nobody excluded but enrolment is voluntary and can opt out of network providers. Targeted enrolment initially to high need/cost patients (inverted risk selection)	Full spectrum (22 GPs, 5 paed, 3 psychotherapists, 22 specialists across 52 practices; 6 hospitals, 3 pharmaceutical manufacturers, 9 nursing homes, 4 ambulatory home health agencies, 5 physios, 14 pharmacies, 22 health and sports clubs, 6 gyms)	Integrated care	Case study	Not described	Not described	Not described	Y
Gesundes Kinzigtal ¹⁰	A Pimperl, T Schulte, A Mühlbach	Evaluating the Impact of an Accountable Care	Germany	Case study of integrated care	Population-based integrated care organisation (joint venture between provider	Two statutory health insurers including the largest in	Primary through to tertiary care	5411 in ACO and 1:1 propensity score	Full spectrum	Integrated care	Case study	635.6 fewer years of potential	Not described	Not described	Not described in

	er, M Rosenmöll er, R Busse, O Groene, HP Rodriguez and H Hildebrand t 2016	Organization on Population Health: The Quasi- Experimental Design of the German Gesundes Kinzigtal			groups and a healthcare management company) with shared savings arrangements, performance incentives and structural support for providers	Southern Germany		matched non-ACO control group extracted from claims data from the participating insurers				life lost (2005.8 vs. 2641.4)			sufficien t detail
Cigna's Col *A–C ³²	RB Salmon, MI Sanderson, BA Walters, K Kennedy, RC Flores and AM Muney 2012	A collaborative accountable care model in three practices showed promising early results on costs and quality of care	US	Provides financial incentives to physician groups and integrated delivery systems to improve the quality and efficiency of care for patients in commercial open- access benefit plans	Registered nurses who serve as care coordinators employed by participating practices are a central feature of the initiative. They use patient-specific reports and practice performance reports provided by Cigna to improve care coordination, identify and close care gaps and address other opportunities for quality improvement. This initiative is a shared- savings program that offers practices in their first year of participation up-front support, in the form of a care coordination fee, for investments in infrastructure that further their progress towards quality and cost targets	Not described	Primary	Wider community	Primary care physicians and registered nurses	Health, integrat ed	Case study	Multiple models — see spreadshe et for details	Not described	Multiple models — see spreadsheet for details	Y
Medicare Pioneer Model ⁹¹	AL Schwartz, ME Chernew, BE Landon and JM McWilliams 2015	Changes in Low-Value Services in Year 1 of the Medicare Pioneer Accountable Care Organization Program	US	Triple Aim objectives: lower costs, improved health and improved patient experience	In 2012, a total of 32 healthcare provider organisations volunteered to participate in the Medicare Pioneer ACO program in which participating organisations receive a bonus payment or are penalised if overall spending for an attributed patient population falls	Not described	Primary and hospital	Wider community	Physicians	Health, integrat ed	Review	Not described	Not described	Main outcomes and measures: Use of, and spending on, 31 services in instances that provide minimal clinical benefit. During its first year, the Pioneer ACO program was associated with modest	N

					sufficiently below or above a financial benchmark, respectively. Performance on 33 quality measures determines the proportion of savings or losses shared by the ACO									reductions in low-value services, with greater reductions for organisations providing more low-value care	
Advocate PIP ¹⁶	MC Shields, PH Patel, M Manning and L Sacks 2011	A model for integrating independent physicians into accountable care organizations	US	Triple Aim objectives: lower costs, improved health and improved patient experience	Advocate Physician Partners is affiliated with Advocate Health Care, a not-for-profit, faith-based health system in northern and central Illinois. The system has 10 hospitals, offers home care, and employs 800 physicians in large multi-specialty groups that are members of the partnership	Blue Cross Blue Shield insurer. Physicians elect the leaders of each local physician-hospital organisation, who then send a delegate to the overall partnership board. Employed physicians occupy many of the Advocate governance seats in the partnership, which places physicians in a super-majority and hospital managers in a minority of individuals serving	Primary and hospital	Patients in Illinois	Approximately 3500 physicians	Health, integrated	Case study	eICU, an IT system that provides biometric, electronic, and video monitoring at a centralised command centre for all 250 adult intensive care beds in eight of its 10 acute care hospitals. Over a three-year period, the percentage of member physicians participating in the highest-level eICU program rose from 73% to 96%. Mortality (raw and risk-adjusted) has decreased for adult intensive care	In 2009 the partnership implemented annual plans for 83% of its 5268 asthma patients. In contrast, a national study showed only 26% of controlled asthma patients and 35% of uncontrolled asthma patients received such a plan from their physicians	At the end of 2005, the partnership's generic prescribing rate (total generics divided by total prescriptions) was 52%; at the end of 2009, it was 71%. The comparable rates for two major insurers in the Chicago metropolitan area were 64.6% and 66.4% respectively; led to annual savings of US\$14.8 million. Partnership physicians across all locations were submitting claims electronically at a rate well over the Chicago market rate of 74.5 %: this submission rate represents an annual savings of more than US\$2 million to providers and another US\$2 million to	Y

												patients steadily since the eICU program was implemented. Between 2004 and 2009, central-line infections fell steadily from 64 to 33 per year. The partnership's results typically exceed 5 National Committee for Quality Assurance (NCQA) results for measures that involve significant condition management such as control of blood sugar, cholesterol, and blood pressure		insurance companies	
Multiple models — see spreadsheet for models ⁹²	S Shortell, R Addicott, N Walsh and C Ham 2014	Accountable care organisations in the United States and England: Testing, evaluating and	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details	Multiple models — see spreadsheet for details

		learning what works													
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Appendix 4 — US Centers for Medicare & Medicaid Services ACO quality outcome measures

Domain	Description
Patient/caregiver experience	<p>Getting timely care, appointments and information</p> <p>How well your doctors communicate</p> <p>Patients' Rating of Doctor</p> <p>Access to specialists</p> <p>Health promotion and education</p> <p>Shared decision-making</p> <p>Health status/functional status</p>
Care coordination/patient	<p>Risk standardised, all condition readmissions</p> <p>Ambulatory sensitive conditions admission: COPD or asthma in older adults</p> <p>Ambulatory sensitive conditions admission: heart failure</p> <p>Percentage of primary care physicians who qualified for electronic health record incentive payment</p> <p>Medication reconciliation</p> <p>Falls: screening for fall risk</p>
Preventive health	<p>Influenza immunisation</p> <p>Pneumococcal vaccination</p> <p>Adult weight screening and follow-up</p> <p>Tobacco use assessment and cessation intervention</p> <p>Depression screening</p> <p>Colorectal cancer screening</p> <p>Mammography screening</p> <p>Proportion of adults who had blood pressure screened in past 2 years</p>
At-risk population diabetes	<p>Haemoglobin A1c control (HbA1c) (<8 percent)</p> <p>Low density lipoprotein (LDL) (<100 mg/dL)</p> <p>Blood pressure (BP) < 140/90</p> <p>Tobacco non use</p> <p>Aspirin use</p>
At-risk population diabetes	<p>Percentage of beneficiaries with diabetes whose HbA1c in poor control (>9%)</p>
At-risk population hypertension	<p>Percentage of beneficiaries with hypertension whose BP < 140/90</p>
At-risk population intravascular disease	<p>Percentage of beneficiaries with IVD with complete lipid profile and LDL control < 100mg/dl</p>
At-risk population intravascular disease	<p>Percentage of beneficiaries with IVD who use aspirin or other antithrombotic</p>
At-risk population heart failure	<p>Beta-blocker therapy for LVSD</p>
At-risk population coronary artery disease	<p>Drug therapy for lowering LDL cholesterol</p> <p>ACE inhibitor or ARB therapy</p>

Case study 1: Partners HealthCare

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>Partners HealthCare is based in Boston, Massachusetts. It formed a Pioneer ACO in 2012 and has been participating in this program for five years</p> <p>Its goals are to provide high-quality care while slowing cost growth through enhanced care coordination</p> <p>Partners-affiliated doctors, hospitals and other healthcare providers form a collaborative network with the goal of providing coordinated, high-quality care. The primary focus is on people with long-term illnesses [2]</p>	<p>Population</p> <ul style="list-style-type: none"> Four Medicare enrolment types (end-stage renal disease, disabled and aged (Medicare) and dually eligible low-income beneficiaries (both Medicare and Medicaid) [2] Approximately 96,000 Medicare patients [1] Patient assignment: Currently retrospective, based on beneficiary's use of primary care services [3] Beneficiaries seeing doctors participating in the model can see any doctor or healthcare provider of their choice [1] <p>Performance</p> <ul style="list-style-type: none"> 33 Centers for Medicare & Medicaid Services measures used to rate quality The program rewards ACOs that lower their growth in healthcare costs while meeting a quality performance standard [1] The ACO submits quality measures to the CMMS web interface on behalf of participating clinicians [1] Services must score above 50% in each performance measure to meet the minimum quality performance category requirement and benchmarks [2] <p>Metrics and learning</p> <ul style="list-style-type: none"> Providers must achieve annual quality targets relative to national data benchmarks. Share of savings depends on overall quality performance [4] 	<p>Cost:</p> <ul style="list-style-type: none"> In years 1 and 2 Partners slowed cost growth [1] By year 4 gross savings of nearly US\$31.5 million were achieved [3] Of the 4-year total savings, Partners earned US\$20.4 million, with US\$11 million going to the federal government [1] <p>Patient experience</p> <ul style="list-style-type: none"> High performance in patient experience quality measures [2] Years 1–4 ~ 82% overall quality score for patient experience [4] <p>Quality</p> <ul style="list-style-type: none"> Aggregate quality score for all 33 quality measures of 88.9% in years 1–3, and 96% by year 4 [2] with above-average performance in 27 of the 33 performance measures tracked [1] 	<p>Enablers</p> <ul style="list-style-type: none"> Greater allocation of funding to support vulnerable groups such as the frail elderly and patients with mental health issues Use of benchmarked data to identify priorities, build on past experiences and compare with services provided by other ACOs Investment in medical homes viewed as a foundational element <p>Barriers</p> <ul style="list-style-type: none"> Substantial clinical infrastructure investment is required Provision of home visits are costly and time-consuming. May not be achievable across all sites and services Some physicians and health providers reported challenges in translating current healthcare

- Large investment in population health management to improve patient access to care [3]

Payment and incentives

- Payers: Incorporates commercial payer MassHealth and the Centers for Medicare & Medicaid Services [1]
- Expenditure benchmark calculated based on risk-adjusted retrospective spending for patients who would have been assigned to the ACO in prior years [1]
- Risk structure: 2-sided risk structure (share in bonuses and pay back losses) [1]. The sharing/loss rate has ranged between 50% and 75% [3]
- Budget scope includes all services except outpatient prescription drugs [1]
- Shared savings distribution [2]:
 - No savings are reinvested in infrastructure
 - Distribution to providers within the ACO
 - Primary care professionals: 12%
 - Specialists: 13%
 - Hospital: 75%

Coordinated delivery

- In primary care, patient-centred medical homes have been implemented where doctors and other providers work as teams to coordinate care [1]
- Focus is on medically complex patients via an integrated care management program that assigns nurse care coordinators to review complications and assist patients at high risk of complications [4]
- Investment in new services to support team-based care and behavioural health programs are integrated with primary care [1]

- In the area of behavioural health, depression screening rates approximately doubled among Medicare patients. Successful strategies included heightened education efforts, improved clinical protocols and tools embedded in EHR [3]
- Improvements were also made across several aspects of aged care [3]

practices and performance improvement models into the Pioneer ACO model and mentioned that confidence in the ACO model was variable

- If an online patient portal is going to be adopted, access to technology needs to be improved and educating users on how the portal can improve their experience needs to be prioritised so care isn't affected
- Many services also indicated that performing case management in an open provider network setting was more challenging than under closed provider networks

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Case study 2: Blue Cross Blue Shield Alternative Quality Contract

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>The Alternative Quality Contract (AQC) was established by Blue Cross Blue Shield of Massachusetts (BCBSMA) in 2009</p> <p>The AQC is built on four core elements: a long-term contract between BCBSMA and providers; a global risk-adjusted budget for a defined population; substantial performance incentives; and clinical and information support</p> <p>Provider participation is voluntary. More than 85% of primary care physicians and almost 90% of specialists in BCBSMA's closed Health Maintenance Organisations (HMO) network participate in the AQC</p> <p>Provider participation rates are stable, with most provider groups who joined</p>	<p>Population</p> <ul style="list-style-type: none"> Collectively, almost 700,000 BCBSMA HMO members are covered under the AQC [2] Patients are required to designate a primary care physician each enrolment year. Members are automatically 'in' the AQC if their primary care physician belongs to an organisation who has joined the contract [2] There are plans to expand the model to members enrolled in open-network plans where provider choice is less restricted [2] <p>Performance</p> <ul style="list-style-type: none"> Performance is rated against 64 process, outcome and experience measures; hospital and ambulatory care measures are included. Measures include appropriate screening and examination procedures, guideline-based medication prescribing and patient satisfaction measures [1] Some of these performance indicators are similar to Medicare's 33 measures used in their ACO programs [2] The higher the aggregate performance the greater the share of any savings (and the smaller the share of any losses incurred) [1] <p>Metrics and learning</p> <ul style="list-style-type: none"> Quality incentives for physicians and healthcare providers are divided into five indicator groups, 	<p>Cost</p> <ul style="list-style-type: none"> AQC groups significantly reduced spending growth compared with control groups. A 10% reduction in overall expenditure was achieved by the fourth year [2] Savings was initially achieved mainly via changes in referral patterns (i.e. directing patients to lower-cost providers for procedures and services) [5] Over time providers have also gradually reduced the volume of unnecessary services — particularly advanced imaging, procedures and tests — with no evidence of compromises in quality of care [4] The only areas of increased expenditure were in evaluation and management costs [3] <p>Patient experience</p> <ul style="list-style-type: none"> Moderate to high patient satisfaction across most quality measures [1] Enrolees reported greater quality of care in comparison to the state average of non-enrolees [6] 	<p>Enablers</p> <ul style="list-style-type: none"> Large population coverage BCBSMA provided ongoing technical and management support to facilitate and implement old and new care services New positions were created within services to provide more support and to coordinate care Although the AQC only covers BCBSMA's commercial enrolees, research shows AQC groups change some of their care management practices broadly across their patients, leading to cost savings for other populations (e.g. Medicare beneficiaries). This spillover effect is larger on spending than on quality <p>Barriers</p> <ul style="list-style-type: none"> Process quality measures did not capture all aspects of healthcare quality Additional staff needed to 'track' patients to ensure they are accessing care which is resource-intensive and not always feasible

the AQC renewing their contracts

An initial target of reducing healthcare spending growth by 50% over five years was set [1]

each with performance thresholds that trigger a bonus payment

- Data are analysed and fed back regularly and bonuses are paid monthly and reconciled at year-end [5]

Payment and incentives

- 3–5-year contract pays providers a global budget that covers the entire continuum of care [1]
- Providers take on two-sided risk (shared savings and losses relative to the global budget benchmark) [2]
- Levels of risk vary by contract and quality scores [1]
- Savings intended to be achieved through improved healthcare processes and reduced wastage, particularly focusing on unnecessary or expensive specialist referrals [3]
- Providers can earn additional payments of up to 10% of their global budget for meeting the 64 quality measures [2]

Coordinated delivery

- Patient assignment and records are updated monthly based on patient's selection of providers [1]
- Group-specific reporting and analysis conducted [3]
- A BCBS support team assists providers to review performance and discuss improvement goals and strategies [1]
- Periodic educational and best-practice sharing forums are conducted

- Reduction in the use of unnecessary testing (such as imaging) [6]

Quality

- In year 1, there was a modest increase in quality scores overall [5]
- Evidence of quality improvement varied across provider groups. Factors influencing outcomes included practice size, level of integration with hospital services, previous experience with risk-based contracting, and patient population characteristics particularly socioeconomic status [3]
- Overall, patients were hospitalised less and used fewer expensive services (e.g. advanced imaging) than the matched comparison cohort [1]

- Savings were largely achieved through shifting referrals to less expensive providers and settings rather than reductions in use — a strategy that is not likely to achieve substantial additional savings in the long term

- Technical support given to providers to assist them with better use of data analytic tools and report generation

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Case study 3: Coastal Medical ACO

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>Coastal Medical ACO is a separate legal entity in Rhode Island formed to participate in the Medicare Shared Savings Program (MSSP). The program offers providers and suppliers (e.g. physicians, hospitals and others involved in patient care) an opportunity to form an ACO for its Medicare enrollees [1]</p> <p>Coastal Medical ACO is accountable for the quality, cost and experience of care for a retrospectively assigned Medicare fee-for-service (FFS) beneficiary population. The Shared Savings Program has different tracks that allow ACOs to select an arrangement that makes the most sense for their organisation. Coastal Medical ACO initially participated in the one-sided track in which savings are shared 50-50 with Medicare</p> <p>Coastal Medical has been engaged in shared savings contracts with various commercial payers since the beginning of 2012; they include Blue Cross Blue Shield of RI, United Healthcare and Tufts Health Plan [1]</p>	<p>Population</p> <ul style="list-style-type: none"> The ACO covered 11,280 Medicare beneficiaries in 2015 [2] Patients served by the ACO continue to have freedom of choice regarding the type of care they receive and the providers they choose to visit, without regard to whether a particular provider is participating in an ACO [3] <p>Performance</p> <ul style="list-style-type: none"> Each provider contract contains specific quality measures that relate to patient care, and performance is measured against 143 quality indicators, which include the mandatory 33 measures specified by CMS [2] <p>Metrics and learning</p> <ul style="list-style-type: none"> There appears to be a strong organisational commitment to engaging staff across clinical and operational roles in the use of performance data to support new approaches to care [2] <p>Payment and incentives</p> <ul style="list-style-type: none"> In performance year 1 and 2 savings were distributed approximately as follows: infrastructure (18%), redesigned 	<p>Cost</p> <ul style="list-style-type: none"> In the first year total savings was US\$7.2 million (5.4% reduction in expenditure) [1] The group saved a combined US\$15.3 million across its federal and commercial shared savings contracts over the 2014–15 year [2] <p>Patient experience</p> <p>Above-average performance across a range of patient experience measures in the Year 3 (2014) reporting period</p> <ul style="list-style-type: none"> Getting timely care Appointments and information (84%) How well your doctors communicate (92.8%) Patients' rating of doctor (92.2%) <p>Below-average performance in access to specialists (81.6%) [4]</p> <p>Quality</p> <ul style="list-style-type: none"> Earned a quality score in the top 1% among 333 MSSP ACOs nationwide in 2014 [1] 	<p>Enablers</p> <ul style="list-style-type: none"> ACO covers large proportion of eligible population Strong prior investment in primary care system strengthening through medical home initiatives In the process of reinventing its care delivery system, Coastal created a new workforce in mainly clinical roles to support providers and patients. In 2014–2015 Coastal hired 151 new staff, most of whom were in positions that did not exist before the group become an ACO. <p>Barriers</p> <ul style="list-style-type: none"> Communication strategies involving all stakeholders are needed to achieve culture change. Messages need to be repeated, consistent and occur in parallel for different sectors of the ACO, which has been a major challenge given

care processes/resources (50%),
distribution to ACO provider (32%) [3]

Coordinated delivery

- Patient-centred medical home model in operation for primary providers with a team-based care model in place. All PCMH sites have achieved the highest level of national accreditation as a PCMH. Coastal Medical has participated in another CMS program to stimulate the creation of PCMHs since 2008
- Patient portal integrated with a single EHR system across all sites
- The group offers 365-day access to sick visits, chronic care management programs, and care teams that support not only patients daily, but their primary care providers as well. Coastal also owns state-wide laboratories, an imaging centre and a medical billing company [1]
- A portion of the initial savings was reinvested back into the organisation to cover incremental costs of new services and to support the continued efforts of staff to transform care [2]

- Highlights include:
 - Lower than national average readmission rate
 - High performance on preventive screening and immunisation activities [4]
 - High proportion of people with chronic disease (e.g. diabetes and hypertension) achieving guideline targets (e.g. 81.4% of people with hypertension at target vs. 68% nationally) [4]

the size and dispersion of the provider network

- Clinical teams need operational support from the ACO organisation and much of this support is in training providers to work differently (e.g. in shifting from doctor-centric to team-based models of care delivery)

References

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Case study 4: Brookings–Dartmouth Accountable Care Collaborative

Model overview	ACO framework	Outcomes	Implementation enablers/ barriers
<p>The Brookings–Dartmouth ACO Collaborative was established in 2007 to advance the ACO model in the private sector and under Medicare. Four provider groups are part of the collaborative; each has established one or more ACO contracting arrangements with commercial payers or Medicare. They are HealthCare Partners (HCP), Monarch HealthCare, Tucson Medical Center (TMC), and Norton Healthcare [1]</p> <p>Each of these ACOs was formed within a supportive local social context marked by collaborative relationships and shared values and aims among stakeholders [2]</p> <p>In establishing the learning network, collaborative sites were selected based on strength of local leadership, commitment to defining and collecting standardised performance measures,</p>	<p>Population</p> <ul style="list-style-type: none"> The four sites vary greatly in size, with between 7000 and 50,000 attributed patients and between 90 and 2700 participating physicians [1] <p>Performance</p> <ul style="list-style-type: none"> The sites have varying degrees of experience with performance-based payments; however, all formed collaborative new relationships with payers and created shared savings agreements linked to performance on quality measures [1] Performance measurement at each site were developed based on the Brookings–Dartmouth starter set measures [2]. Details on specific performance indicators were not accessible; however, as a general principle shared savings are based on performance on efficiency metrics such as avoidable emergency department visits, imaging rates and hospital readmissions [1] Additionally, HCP and Monarch include efficiency metrics and claims-based measures derived from the California Integrated Healthcare Association pay-for-performance program, while TMC includes 35 measures of quality, efficiency and ‘systemness’ [2] 	<p>Monarch HealthCare is the only site with available outcome data and all outcomes are based on Medicare data for this ACO only</p> <p>Cost</p> <ul style="list-style-type: none"> Reduced expenditure by 5.4% in 2012 from its baseline, while national medical costs grew by 1.1% for a comparable population [3] This favourable expense trend was driven primarily by reductions in hospital admissions and skilled nursing facilities utilisation and unit costs [3] Consistent savings in all performance years ranging from US\$1.5 to US\$8.4 million per year with reduced savings in later years of the program [4] <p>Patient experience</p> <ul style="list-style-type: none"> Overall patient experience score based on quality measures from Years 1–4 approximately 80% [4] 	<p>Enablers</p> <ul style="list-style-type: none"> Despite substantial variation with respect to each site’s approaches to ACO development, common success factors included a committed executive leadership and governance, a strong payer-provider relationship and past experience with performance-based payment [1] Each payer–provider group exchanged historical data and identified baseline performance status to gauge the success of their ACO initiatives [2] Starting small — initial efforts to establish the ACOs focused on discrete populations of patients that represented a small proportion of the total number of patients seen by these organisations. Similarly, they involved only a portion of the total physician population, leaving room to expand the ACO provider network Future involvement of additional providers (e.g. medical specialists, behavioural health providers and home health providers) and other care settings (e.g. nursing homes)

presence of a willing private-payer partner, and the possibility of including at least 15,000 commercial patients and 5000 Medicare patients in the ACO [1]

The collaborative focused on two core priority areas: ACO formation (fostering the development of organisations capable of establishing contracts and providing care across the continuum); and implementing support strategies to enhance ACO performance in cost and quality outcomes [1]

Metrics and learning

- Each organisation has invested substantially in physician engagement strategies [1]. These include enhanced communication efforts, involving physicians in decision-making, and promoting physician leaders [2]
- All sites emphasise the need for timely data sharing between the payer and provider groups, to achieve patient care during the performance year. They aim to receive at least quarterly data feedback to providers [1]

Payment and incentives

Information was largely obtained from a 2012 case study report and may be out of date

- All four sites worked closely with one of the large commercial payer partners to develop the key elements of an ACO agreement and infrastructure [1]
- Multi-year agreements were established with the option to modify these agreements on an annual basis to provide flexibility as the model evolved. Common elements of the agreement included length of commitment, commitment to certain performance measures, clear articulation of the payment model, and patient assignment methods (attributing patients to specific providers) [1]
- All four sites initially chose a 'one-sided' shared savings model with no risk in the first year, with the expectation that they would transition to future shared-risk models [1]

Quality

- Year-on-year increase in overall quality score [4]:
 - 2013: 84.01%
 - 2014: 85.7%
 - 2015: 88.17%

and assisted living facilities) could enhance the ability of the ACOs to integrate care initiatives more comprehensively

- ACOs initially focused on a single commercial payer and as experience grew some sites moved to multi-payer ACO arrangements, particularly through participation in one of the Medicare ACO initiatives [2]

Barriers

- All ACOs faced substantial challenges in navigating the legal and contractual arrangements associated with a new payment model [2]
- None of the four organisations had full electronic health records interoperability across the care continuum [2]
- Care management capabilities are not fully developed and to build such capabilities would require substantial investments to create new workforces, refine or develop new care management tools, resources and methods [2]
- Building trusting relationships among physicians, payers and other collaborative partners is an ongoing

- In 2012 Monarch and HealthCare Partners indicated readiness to accept partial or global capitation while Norton and Tucson Medical Center had less experience with managing risk and anticipated a longer transition to risk-bearing payment models [1]
- The split of shared savings between the provider group and payer partners ranged from 50–50 to 60–40. Approaches to distributing shared savings within the ACO varied from reinvesting in system improvements to sharing up to 65% with ACO physicians [1]
- To achieve shared savings, HCP and Monarch had first to meet an established performance threshold based on a composite of quality measures. Shared savings were then determined from efficiency metrics. Evidence of poor quality was also a disqualifying factor for shared savings at TMC. Norton linked shared savings to performance on the starter set of measures [2]

endeavour and achieving a shared vision across the ACO is difficult [2]

Coordinated delivery

- Each organisation emphasises two-way communication with the community, with activities such as outreach, town hall meetings, shared decision-making training including community representation on advisory boards and steering committees, and promotion of peer educators [1]

- HCP and Monarch provide a broad array of care management and care coordination services, while Norton and TMC have focused more on the inpatient setting [1]
- HCP and Monarch have extensive programs for patients at high risk of hospitalisation. Norton and TMC do not have processes to systematically identify these patients [2]
- Although each site has implemented an electronic health record in at least one care setting, no site had achieved interoperability between ambulatory and inpatient settings in 2012 [1]

References

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- [3] Primary Care Collaborative (2015). Monarch Healthcare — CMS Pioneer ACO Reported Outcomes. Accessed 19.09.2017 from [\[Link\]](#)
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Case study 5: Colorado Regional Care Collaborative Organisation

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>Colorado is using an accountable care collaborative (ACC) model to expand medical home services for its adult and paediatric Medicaid population</p> <p>Under this model Medicaid contracts with the Regional Care Collaborative Organization (RCCO) in each of seven regions of Colorado to create a network of Primary Care Medical Providers (PCMPs)</p> <p>Medicaid provides funds to these regional organisations for clinical and operational support, while they in turn aim to support the care coordination of Medicaid enrollees and their integrated care with hospitals, specialists and</p>	<p>Population</p> <ul style="list-style-type: none"> As of June 2015, there were 899,596 Medicaid clients enrolled in the ACC (approximately 70% of all Colorado Medicaid clients) [3] <p>Performance</p> <ul style="list-style-type: none"> Medicaid contracts with the Statewide Data and Analytics Contractor (SDAC) to analyse performance data for the program Performance is assessed at provider and RCCO levels across a narrow range of domains. 2015 key performance indicators included: emergency department utilisation, well-child checks (ages 3–9 years) and provision of postpartum care [3] PCMP organisational capacity is also measured on meeting standards for an enhanced patient-centred medical home [3] RCCOs are eligible to receive additional payments based on their relative performance in certain areas. For 2014–15, RCCOs were measured on their performance in increasing the number of follow-up care appointments for clients within 30 days of discharge from a hospital[3] New payments planned for additional non-performance indicator targets (e.g. appropriate post-hospital care and screening for physical and behavioural health and wellness in adolescents) [3] <p>Metrics and learning</p>	<p>Cost</p> <ul style="list-style-type: none"> The program generated approximately US\$100 million in gross program savings (US\$31 million in net savings) in 2013–2014 [5] <p>Patient experience</p> <ul style="list-style-type: none"> Members viewed the program positively for improving access and quality Most members self-reported maintenance or improvements in overall health status[4] <p>Quality</p> <p>When compared with matched patients not enrolled in the program, key outcomes include:</p> <ul style="list-style-type: none"> 8% fewer emergency department services for adults enrolled in the program for more than 6 months Fewer readmissions for children and adult members without disabilities 	<p>Enablers</p> <ul style="list-style-type: none"> Good population coverage Providers expressed positive perspectives on the program [4] Centralised data repository to track and report clinic performance viewed as a strength [2] <p>Barriers</p> <ul style="list-style-type: none"> The majority of clinics felt that at least some of the performance measures were not appropriate or were not good indicators of a practice's performance [4] PCMP clinics experienced difficulties in interpreting the data available in the SDAC (e.g. members attributed to the clinic that are not regular patients and conversely regular patients that are not attributed to them) [4] Inconsistent receipt of hospital data via the RCCO was also a barrier to provider

<p>social services. PCMPs contract with the RCCOs to provide medical home primary care services to Medicaid enrollees [1]</p> <p>PCMPs receive fee-for-service reimbursements for medical services rendered to enrolled Medicaid beneficiaries and additionally incentive payments are available based on performance</p> <p>Incremental reductions in costs are anticipated but not required as part of the contracting arrangement [2]</p> <p>The model was implemented without substantial federal investment. State-based investment of approximately US\$155 million provided between 2011 and 2014 [2]</p>	<ul style="list-style-type: none"> • Engagement with external evaluators. An independent evaluation was conducted in 2016 by the Colorado School of Public Health[4] • A health information technology contractor analyses and reports on claims data to help the department, RCCOs and PCMPs see patterns in how members are using health care services [3] <p>Payment and incentives</p> <ul style="list-style-type: none"> • Incentive payments are available for RCCOs and PCMPs that meet performance targets and for PCMPs that meet at least 5 of the 9 standards for an enhanced patient-centred medical home [3] • From 2015, RCCOs received a payment for members who were assigned to a medical home within six months of enrolling in the program [3] <p>Coordinated delivery</p> <ul style="list-style-type: none"> • Care coordination varies greatly by practice size, with larger practices using more resources and more elaborate care coordination efforts [4] • The specific models of care coordination varied and included focus on high-risk patients, specific topics or diseases and integrated care coordination teams dedicated to groups of patients [4] • Small practices tended to take a narrow approach to care coordination, focusing on specialist referral processes. Medium-sized practices' definition tended to be broader, with more emphasis on social determinants of health <p>Large practices tended to have the broadest definition of care coordination, with a focus on pursuing medical home national accreditation goals.</p>	<ul style="list-style-type: none"> • Use of emergency department services for members with disabilities was slightly higher than for those not enrolled • 3% fewer imaging services for members with disabilities • 16% fewer imaging services for adult members • 12% fewer imaging services for child members [5] 	<p>engagement in performance metrics [4]</p> <ul style="list-style-type: none"> • Community engagement strategies need to be enhanced to ensure members play a more active role in the ACC program. Given the targeted communities often experience high levels of socioeconomic hardship, engagement strategies can be difficult to implement [4]
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These practices tended to have the most formalised models and team-based processes in place for care coordination [4]

References

- [1] Patient Centre Primary Care Collaborative, Colorado Medicaid Accountable Care Collaborative (ACC) 2017 [\[Link\]](#)
- [2] McConnell KJ, Renfro S, Chan BK, et al. Early Performance in Medicaid Accountable Care Organizations: A Comparison of Oregon and Colorado. *JAMA Intern Med* 2017;177(4):538-45. [\[Link\]](#)
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Case study 6: Oregon Coordinated Care Organisations

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>The state of Oregon launched an initiative in 2012 to create Coordinated Care Organisations (CCOs). These are geographically defined organisations that represent partnerships between payers, providers and community organisations to provide coordinated healthcare [1]</p> <p>CCO governing boards include healthcare providers, community members and stakeholders in the local health systems [1]</p> <p>The initiative is supported by a US\$1.9 billion federal government investment over 5 years (2012–2017) [1]</p> <p>CCOs accept full financial risk for their patient population and must manage all care (including mental health, addiction and dental services) within a global risk-adjusted budget [2]</p>	<p>Population</p> <ul style="list-style-type: none"> 600,000 Medicaid members enrolled across 16 CCOs (~ 90% of the Medicaid population) Automatic enrolment based on being a resident within a defined region with exceptions for people with special health needs [1] <p>Performance</p> <ul style="list-style-type: none"> 17 CCO incentive metrics based on survey data, claims data and chart review data Data are analysed by a technical advisory group and reviewed by a scoring committee) [3] <p>Metric and learning</p> <ul style="list-style-type: none"> Little information available on how providers engage in use of data Performance on various indicators are publicly available via annual reports <p>Payment and incentives</p> <ul style="list-style-type: none"> CCOs are held accountable dependent on performance on an 	<p>Cost</p> <ul style="list-style-type: none"> The state has met its spending targets each year and avoided any financial penalties Growth in spending has been reduced by 2% per year [3] Compared with a 2011 baseline, 2014 data shows: <ul style="list-style-type: none"> Spending for inpatient care decreased by 14.8% Spending on outpatient care decreased by 2.4% Spending on primary care services <i>increased</i> by 19.2% (reflective of greater access for Medicaid members [3] <p>Quality</p> <ul style="list-style-type: none"> All 16 CCOs showed improvements in the pay for performance program, and 13 out of 16 CCOs earned 100% of their quality pool payments for 2014 [3] <p>Patient experience</p> <ul style="list-style-type: none"> Increase in patient satisfaction with care (78% to 83.1%) from 2011 baseline data to 2013 [4] <p>Service utilisation</p>	<p>Enablers</p> <ul style="list-style-type: none"> High population coverage Strong financial incentives and penalties Transparent annual data reporting by Oregon Health Authority Large infrastructure support funding from federal government to establish the program <p>Barriers</p> <ul style="list-style-type: none"> Variations in provider use of electronic health records — difficulty in obtaining accurate data [3] Mixed performance on measures not connected to incentive payments (e.g. deterioration in cervical cancer screening) [5] Potential lack of buy-in from providers (Some providers — particularly hospitals and some specialists — may be paid less with the CCO transformation, either through reduced reimbursement rates or reductions in volume of services [1]

The state aims to reduce annual spending growth rate to 4.4% in 2014 and 3.4% in 2015 (from 5.4% baseline in 2013) without any reduction in quality performance [1]

If growth reduction targets are not achieved, Oregon faces substantial penalties, ranging from US\$145 million for not achieving the second-year goal to US\$183 million in years 4 and 5 [1]

- overall quality score based on 17 quality measures [1]
- Performance on these measures determines how much CCOs may be paid out of an 'incentive pool'
- The state is also accountable to the Centers for Medicare & Medicaid Services (CMS) through the standard 33 accountability measures (16 additional measures). A failure to meet minimum quality targets triggers penalties [1]
- The state also is contractually bound to reduce the rate of Medicaid spending by 2% without degrading quality. A failure to meet these targets also triggers penalties [1]

Coordinated delivery

- CCOs must manage all ambulatory care (including mental health, addiction and dental services) and hospital care within the global budget
- Minimum requirement of at least 60% of members assigned to a Patient-Centered Primary Care Home (PCPCH) in order to receive incentive pool funds. The PCPCH serves as the primary agency for coordinating care [3]

- Emergency department visits decreased by 22% since 2011 baseline data [3]
- 26.9% reduction in admissions for patients with diabetes with short-term complications since 2011 baseline data [3]
- 60% reduction in admissions for patients with COPD or asthma since 2011 baseline data [3]
- 11% increase in outpatient primary care visits since 2011 baseline [4]
- 56% increase in medical home patient enrolments since 2011 [3]

Other measures

- 13/16 CCOs improved on all-cause readmission to hospital
- All 16 CCOs met their target on timeliness of antenatal care (overall 82.9% of these women received prenatal care in a timely manner)
- 10/16 CCOs met the benchmark of 47% of eligible population undergoing colorectal cancer screening [3]

- Achieving cost targets while improving quality. The aim is to achieve savings by reducing unnecessary and inefficient care. However, if utilisation is not reduced, CCOs may resort to reimbursement reductions. Large reductions may reduce access to providers [1]
- Managing failures — strategies for addressing sustained performance failure by a CCO have not been well articulated [1]

References:

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Case study 7: Accountable Health Communities model

The Accountable Health Communities model	ACO framework	Outcomes	Implementation barriers/enablers
<p>The Accountable Health Communities model is a US\$157million US federal government program. It aims to support local communities address the health-related social needs of Medicare and Medicaid beneficiaries by bridging the gap between clinical and community service providers [2]</p> <p>By addressing critical drivers of poor health and high healthcare costs, the model aims to reduce avoidable healthcare use, reduce the costs of healthcare, and improve health and quality of care for Medicare and Medicaid beneficiaries [1]</p> <p>The goal of the program is to provide support to community bridge organisations to test promising service delivery approaches aimed at linking beneficiaries with community services that may address their health-related social needs (i.e.</p>	<p>Population</p> <ul style="list-style-type: none"> Up to 3 million Medicare and Medicaid recipients per annum are expected to be covered by this program from 2017–2022. 12 organisations will participate in an ‘Assistance Track’, focused on provision of navigation services for high-risk beneficiaries to help address health-related social needs (US\$2.57 million average funding per organization allocated over 5 years) 20 organisations will participate in an ‘Alignment Track’, which will additionally encourage service alignment by participating partner organisations to ensure that community services are available and responsive to the needs of beneficiaries (US\$4.51 million average funding per organisation allocated over 5 years) The 32 organisations are spread across 193 urban and rural counties in 23 states [2] <p>Performance</p> <ul style="list-style-type: none"> There will be an independent evaluation of the Accountable Health Communities Model to determine the impact of the model on quality of care and spending, including total healthcare costs and inpatient and outpatient healthcare use Beneficiaries who receive services under the Assistance Track will be randomised to different types of services, in addition to receiving usual care. For the Alignment Track, the Centers for Medicare & Medicaid Services will use matched comparison groups [2] <p>Metrics and learning</p>	<p>Planned outcomes</p> <p>Utilisation</p> <ul style="list-style-type: none"> Optimised community capacity to address health-related social needs <p>Cost</p> <ul style="list-style-type: none"> Reduced inpatient and outpatient healthcare use and total cost of healthcare [3] <p>Patient experience</p> <ul style="list-style-type: none"> Increased beneficiary awareness of community resources Increased beneficiary access to community resources <p>Quality</p> <p>Specific information has not been provided but quality outcome indicators have been identified in the following domains [3]:</p> <p>Core:</p> <ul style="list-style-type: none"> Housing instability Utility needs Food insecurity Interpersonal violence 	<p>Not able to be assessed given the early stage of the program</p>

housing instability, food insecurity, utility needs, interpersonal violence and transportation needs)

[2][3]

These bridge organisations act as local hubs and will form consortia that will identify and partner with clinical delivery sites to conduct systematic screening of health-related social needs

- Provider and payers are using tools such as geographic information systems to track and observe trends in health data, providing insights into high-risk populations and helping to prioritise areas for interventions
- Those participating in the alignment track will be given an annual lump sum of \$350,000 to form a 'backbone organisation' that will focus on community-wide continuous quality improvement, including an advisory board that facilitates service provision, and data-sharing to identify gaps in service need

Payment and incentives

- No details available. There do not appear to be any risk-sharing agreements contained in the current model

Coordinated delivery

The model identifies four strategies to support implementation:

- **Identify and scale best practices.** The first goal is to develop a unified learning community in which practitioners and administrators can share experiences covering the full spectrum of activities related to addressing patients' social needs: screening, referral, connection to a resource, and ongoing follow-up back to the referring provider
- **Gain maximum efficiency.** Given patients access different care points, the second goal is to implement a central hub of trained and supervised community health workers that is accessible to any participating provider
- **Enable unified data-insight and technology systems.** To facilitate the first two goals, the third goal is to establish an integrated technology system that merges with the regional health information exchange to provide care team members with insight into a patient's social needs in a similar way to how they can view clinical information

- Transportation

Supplemental:

- Family and social support
- Education
- Employment and income
- Health behaviours

Outcomes for providers (e.g. staff turnover, physician burnout) have also been proposed

- **Ensure true community partnership.** In partnership with a robust community advisory board, the fourth goal is to track and assess community referral outcomes data to (1) develop a quantitative business case for resource connections and (2) determine where additional community advocacy and resources are necessary [1][2]

References

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Case Study 8: Gesundes Kinzigtal

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<ul style="list-style-type: none"> Joint venture between a physician network (MQNK) and a health science-based company (OptiMedis AG) (66%:33% split), cooperating with ~260 organisations Gesundes Kinzigtal contracts with care providers as well as collaborating with a range of community groups including gyms, sports clubs, education centres, self-help groups and local government agencies [2] It also runs health promotion programs in schools and workplaces and for 	<ul style="list-style-type: none"> Population <ul style="list-style-type: none"> ~10,000 patients are actively enrolled from a potential eligible pool of 33,000 people covered by the two regional insurers [1] Enrolment has applied an 'inverse risk' model targeting higher need/cost patients (people with lower socioeconomic status, the elderly and those with high rates of chronic disease risk factors) [1] Performance <ul style="list-style-type: none"> Rolling external evaluations have been implemented Broad cost and quality metrics based on satisfaction surveys and other structured electronic health record data are routinely generated [1] Metrics and learning <ul style="list-style-type: none"> Strategies established to promote a physician-driven quality improvement culture [1] GP quality and efficiency dashboards built Clinicians are trained in shared decision-making to support increased patient involvement in care processes [3] Targeted programs made available for high-risk population groups, such as older people, those 	<ul style="list-style-type: none"> Cost <ul style="list-style-type: none"> 2006–2010, reduced costs by 16.9% for members of one of the sickness funds, compared with members from a different region. Acute hospital admissions increased by 10.2% for patients in Kinzigtal, compared with a 33.1% increase in the comparator group [2] 2007–2014 total savings of US\$38.2 million [1] By 2017, the program reported an overall reduction of 6% in projected healthcare expenditure since inception [2] A slowing of the rate of increase in healthcare costs for the whole region has been observed (beyond active enrollees in Gesundes Kinzigtal) [2] 	<ul style="list-style-type: none"> Enablers <ul style="list-style-type: none"> High patient engagement and population coverage [1] Physician ownership and supportive culture [1] Long-term contracting (10 years) and substantial upfront investment from insurers [1] Regional collaboration actively encouraged Transparent data-reporting mechanisms established [1] There is a large number of patients in any one region — especially in urban areas — and so dividing regions into smaller populations and managing care within those smaller units has been a successful strategy [2] Barriers <ul style="list-style-type: none"> Insurers worried about free-riding may be less willing to engage

<ul style="list-style-type: none"> • unemployed people, and 'patient university' classes to offer health advice to support prevention and self-management [2] • Four advisory councils have been established — patient board, patient ombudsman, physicians' board and providers' board [1] • • 	<ul style="list-style-type: none"> • living in nursing homes, people with long-term conditions and people with high body mass index [2] • • Payment and incentives • The federal and local governments allocate budgets to insurers based on risk-adjusted patient volume [2] • Risk-sharing agreements between Gesundes Kinzigtal and the two regional health insurance funds have been established [2] • Currently there is a fee-for-service model but plans are underway to move to a capitation-based model with a per-patient per-quarter payment for physicians [1] • Add-on payments to encourage care coordination are available. Add-on payments comprise up to 10% of total reimbursement of physicians [1] • Hourly reimbursement for participation in quality circles is provided [1] • Additional bonuses paid to providers if savings achieved • • Coordinated delivery • There is a system-wide electronic health record enabling access to information by all participating providers [2] 	<ul style="list-style-type: none"> • Patient experience • 92% patient satisfaction rate [1] • 92.1% would recommend the ACO program to family or friends [3] • 24% of patients questioned stated they would now live 'healthier' than before enrolment [3] • • Quality • Increased life expectancy among enrollees by 1.2 years and mean age of death 1.4 years higher than non-ACO enrollees [1] • 7% absolute difference in osteoporotic fracture rates compared with control group [1] • A decline in over-, under- and misuse of healthcare in the region has been observed [2] 	<ul style="list-style-type: none"> • Lack of buy-in from other insurers • Shared savings calculation methods are complex and can be contested • There is an administrative and technology burden to operationalise the model [1] • There are complexities when navigating contracting with multiple payers [2] • Tailoring the integrated care initiatives for each provider organisation is necessary but resource-intensive [3] • The Kinzigtal Valley is a small, close-knit community within a relatively simple payment environment. As such, some might question whether this type of initiative could succeed in different or more complex markets [2] • •
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- There are multidisciplinary care teams with assigned case managers [1]
- Non-medical services are commissioned to support care plan implementation (gyms, workplace programs) [1]
- Patient self-management strategies and open notes processes to enable full patient access to their entire medical record are being implemented [1]

References

[1] McClellan, et al. (2017). Accountable Care Around the World: Lessons and Policy Implications for the US. *The Commonwealth Fund*. [\[Link\]](#)

[2] The Advisory Board Company (2016). The Business of Population Health Management — Gesundes Kinzigtal. Global Forum for Health Care Innovators. Accessed 29.09.2017 from [\[Link\]](#)

[3] Hildebrandt, et al (2015). Triple Aim — Evaluation in der Integrierten Versorgung Gesundes Kinzigtal — Gesundheitszustand, Versorgungserleben und Wirtschaftlichkeit. Bundesgesundheitsblatt, Gesundheitsforschung, Gesundheitsschutz. 58(4–5): 383–392. Accessed 26.09.2017 from [\[Link\]](#)

Case study 9: Ribera Salud Hospital System

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>Public-private partnership between the regional government of Valencia and a private healthcare delivery company, Ribera Salud (Ribera Health) covering the Alzira municipality. The model combines public funding, ownership and control with private healthcare provision [1] [2]</p> <p>Ribera Salud receives an annual, indexed fixed capitation fee from the regional government to provide the full range of healthcare services with no additional out-of-pocket costs for all residents in Alzira [1] [3]</p>	<p>Population</p> <ul style="list-style-type: none"> Patients within the Ribera Salud catchment area (approx. 250,000 registered inhabitants of the health district of Alzira, all of whom have an electronic health card) [1] Specifics on patient attribution model were not accessible (e.g. people who move out of the region) <p>Performance</p> <ul style="list-style-type: none"> The regional government rates performance against various quality and safety targets [1] Performance is tracked through Ribera Salud's information system, which also includes universal electronic health records [1] [2] <p>Metrics and learning</p> <ul style="list-style-type: none"> All clinicians can access their own performance scores online. These scores are benchmarked weekly against the clinician's peers and are used for continuous improvement processes [3] Performance data are not made public <p>Payment and incentives</p> <ul style="list-style-type: none"> Ribera Salud retains profits up to 7.5% of the global capitation budget. Any additional profit is passed on to the local government [1] If a patient within Ribera Salud's catchment areas opts to access a different healthcare provider, Ribera Salud has to pay 100% of the costs — costs usually higher 	<p>Cost</p> <ul style="list-style-type: none"> 27% lower expenditure per capita for Ribera Salud patients than for other residents of the Valencia region from 2006–2010 (although some detail lacking on whether this represents total costs of ancillary services) [2] <p>Patient experience</p> <ul style="list-style-type: none"> Patient-satisfaction levels were about 20% higher than comparison regions in 2010 [1] Far shorter waiting times (50% shorter waiting times for consultant appointments and surgery, and 12.5% shorter waiting times for scans) than comparison regions in 2010 [1] <p>Quality</p> <ul style="list-style-type: none"> 34% reduction in hospital 3-day readmission rate 	<p>Enablers</p> <ul style="list-style-type: none"> Powerful information management capacity with ability to monitor physician-level and team-level performance in real time Electronic healthcare records displaying real-time information, including X-ray and lab results, available to all clinicians (in both primary and secondary care) Patient empowerment strategies considered an enabler but little information on specifics of these strategies available Incentives structured at multiple levels within the system (staff and provider level) <p>Barriers</p> <ul style="list-style-type: none"> Population health inclusive of preventive health and social determinants of health is not actively considered within the model. Ribera Salud's contract is focused on primary and secondary services provision

<p>Services include integration of primary and secondary service delivery (1 hospital, 4 integrated health centres, 46 primary health centres)</p>	<p>than Ribera Salud's own (based on the relevant DRG). Conversely, if Ribera Salud treats a patient from another district, it receives only 80% of the average regional cost [2] [3]</p> <ul style="list-style-type: none"> • Primary care doctors — 50% are employed by Ribera Salud with 90% fixed salary and 10% based on incentives. The remainder of health staff are on fixed salaries without incentives. Hospital doctors are all salaried (80% fixed salary, 20% incentives) [1] [2] • Performance bonuses are calculated based on performance of the overall company, the local team or service and the individual provider [1] • Other incentives to providers include passing on a portion of retained profits, although no information was available on the profit-sharing between the central administration and providers [2] [3] • Incentives are contingent on meeting quality targets • Penalties for failure to meet quality targets can include failure to renew contracts in extreme circumstances, but there was little information available on what incurs a penalty and whether there is downside risk (paying back losses for cost overruns) [2] [3] <p>Coordinated delivery</p> <ul style="list-style-type: none"> • Single universal electronic health record system supports information sharing between providers [1] • A Plan for Chronic Patients program was implemented in 2012 for 4539 patients over 75 years of age with more than two chronic diseases, complex treatments and exposure to multiple medications. Team-based initiatives were implemented to support care for this population [2] An internal medicine specialist is co- 	<ul style="list-style-type: none"> • Average length of stay 20% less than comparison regions in 2010 [1] • Plan for Chronic Patients program was associated with a 25% decrease in emergency department use [1] [2] 	<ul style="list-style-type: none"> • Some concerns expressed about whether the data methods and metrics used to illustrate beneficial outcomes are sufficiently robust • More detailed information on financial data performance is not publicly available
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- located in each health centre and nurses have a specific role in chronic care services
- There is no information on patient engagement strategies, such as representation on governing committees or involvement in the planning of services

References

- [1] McClellan M, Beales S, Macdonnell M, Thoumi A, Shuttleworth B, Cohen S. (2013). Focusing accountability on the outcomes that matter. World Innovation Summit for Health. [\[Link\]](#)
- [2] S Russell, E Rowley. (2014). Evidence-based review: Accountable Care Organisations. East Midlands Academic Health Science Network. [\[Link\]](#)
- [3] PWC UK. (2017). Shifting to accountable care: characteristics and capabilities. [\[Link\]](#)

Case study 10: Mid-Nottinghamshire Better Together Health and Social Care

Model overview	ACO framework	Outcomes	Implementation barriers/enablers
<p>Mid-Nottinghamshire Better Together Health and Social Care (referred to as Better Together) is an alliance of regional providers and stakeholders in central England that have integrated primary, acute and social care systems to serve a population with high rates of non-communicable diseases [1]</p> <p>Better Together is one of 50 vanguard programs that formed after the British National Health Service's Five Year Forward View report [1]. Partners include two NHS commissioners that represent Nottinghamshire's two Clinical Commissioning Groups, a local authority commissioner, and seven provider groups across primary, mental health, acute, ambulatory, after-hours and community health services [1]</p> <p>The governance structure consists of a Strategic Board, which governs the alliance,</p>	<p>Population</p> <ul style="list-style-type: none"> • 310,000 catchment size [1] • Better Together identifies patients at risk of hospitalisation with the Devon Risk Stratification Tool, a locally developed algorithm that ranks patients according to their future risk of admission, using demographic and clinical information from hospital datasets that cover the past two years of patient history, as well as data from GP practices and out-of-hours and ambulance services [1] • Once patients are identified, a multidisciplinary team provides targeted interventions using either case management, disease management or supported self-care [1] <p>Performance</p> <ul style="list-style-type: none"> • The outcome framework spans four domains: population health, quality of life, quality of care and care effectiveness [1] • This is supplemented with 'transformational' measures — process measures that can include financial performance and resource use [1] • Providers are also required to report on nationally set standards of care such as workforce requirements or waiting times [1] 	<p>Cost</p> <ul style="list-style-type: none"> • In 2016–17, Better Together generated £23 million in total savings, £3.5 million in gross savings, and a 122% return on investment [1] <p>Patient experience</p> <ul style="list-style-type: none"> • No data available <p>Quality</p> <ul style="list-style-type: none"> • Reduced inappropriate emergency attendance by 4% in first year [1] • Reductions in emergency department waiting times, length of hospital stay and overall number of hospitalisations [1] • Elderly presented to emergency departments 29% less than matched residents in other parts of the country and were admitted 23% less often [3] 	<p>Enablers</p> <ul style="list-style-type: none"> • Financial and policy support from the government to experiment with accountable care [3] • Strong relationships between public and private-sector officials to facilitate integration of care [3] • A single health record that patients have access to and that is shared across organisations among all health professionals [2] • Access to 24-hour advice via electronic, telephone, or face-to-face consultation with the appropriate health professional [2] • Better support for patients with long-term conditions using bespoke care plans and timely access to services [2] • Emphasis on carer support [2] <p>Barriers</p> <ul style="list-style-type: none"> • Sustainability of financial support — NHS financial and operational pressures have the potential to undercut strategies and long-term impacts [1] • Perceived risk of global capitation

oversees operating divisions and establishes performance measures for the system.

Different functional groups support the work of the board.

Local stakeholders provide feedback through the Citizens' Board, while high-level decisions and collaboration with state institutions occurs through

Organisational Statutory Bodies.

Working groups institutionalise a focus on quality and performance improvements, with dedicated staff evaluating a range of features (e.g. system resilience, financial strategy) [1]

Metrics and learning

- Heavy use of data analytics to drive improvements in quality and outcomes. Better Together routinely collects and reports clinical data and administers surveys to patients to capture their experience [1]
- Clinicians also regularly meet to share best practices to facilitate the referral pathway [1]

Payment and incentives

- Services delivered under a global capitated contract. A three-part capitated payment model supplemented by distribution of risk and reward across the system was developed
 - A **fixed element** based on the benchmarked costs for each provider, requiring the alliance to deliver care for a predetermined payment
 - An **outcomes element** tied to performance, comprising up to 2.5% of a provider's income
 - A **variable element**, to account for uncontrolled variance in the alliance
- Accompanying the three elements are additional shared risk and reward incentives to promote collaboration within the alliance [1]

Coordinated delivery

- A Profiling Risk Integration and Self-Management (PRISM) Model is being used that comprises three elements — risk stratification, care integration and self-

model by providers [1]

- Concerns about data quality and information governance — individual organisations must develop their own infrastructure to adapt the centrally generated NHS data. To address this, Better Together focused on developing interoperable systems rather than schemes that require significant new capital investment and infrastructure [1]

management for patients with long-term conditions who are at high risk of future hospital admission [1]

- Provider teams visit each GP on a monthly basis to discuss patients identified as having a high risk for admission. This enables mobilisation of social services in addition to traditional clinical interventions and facilitates self-management strategies [1]
- The Medical Interoperability Gateway (MIG) allows for the secure and safe sharing of GP patient records for all urgent and emergency care providers
- Out-of-hours providers and emergency departments supported to make use of the MIG by installing common software systems in GP surgeries and emergency departments [1]
- Additionally, Better Together uses Florence Simple Telehealth (FLO), a telehealth system that enables providers and patients to communicate remotely to improve patient self-monitoring. The system helps patients remain at home, alerting providers if a patient's condition starts to deteriorate [1]

References

- [1] McClellan, et al. (2017). Accountable Care Around the World: Lessons and Policy Implications for the US. The Commonwealth Fund. [\[Link\]](#)
- [2] National Health Service. (2014). Mid-Nottinghamshire NHS Better Care Fund Case Study. [\[Link\]](#)
- [3] The Health Foundation. (2017). Briefing: the impact of providing enhanced support for care home residents in Rushcliffe. [\[Link\]](#)