

# The bigger, the better? A systematic review on the impact of mergers on primary care organizations

Gianfranco Damiani<sup>1,2,1</sup>, Domenico Pascucci <sup>1,2,1</sup>, Alessandro Sindoni <sup>3</sup>, Rosario Mete<sup>4</sup>, Walter Ricciardi<sup>1,2</sup>, Paolo Villari<sup>3</sup>, Corrado De Vito<sup>3</sup>

1 Dipartimento di Scienze della Vita e Sanità Pubblica, Università Cattolica del Sacro Cuore, Rome, Italy

2 Dipartimento di Scienze della Salute della Donna, del Bambino e di Sanità Pubblica, Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome, Italy

3 Dipartimento di Sanità Pubblica e Malattie Infettive, Sapienza Università di Roma, Rome, Italy

4 Distretto 9, ASL Roma 2, Rome, Italy

**Correspondence:** A. Sindoni, Dipartimento di Sanità Pubblica e Malattie Infettive, Sapienza Università di Roma, Piazzale Aldo Moro 5, 00185 Roma, Italy, Tel: +39 0649694304, Fax: +39 0649914449, e-mail: [alessandro.sindoni@uniroma1.it](mailto:alessandro.sindoni@uniroma1.it)

\*These authors contributed equally

**Background:** Primary care services are the first point of contact in a healthcare system; in the last years, many mergers and reconfigurations have taken place in this setting. The aim of this study is to summarize the literature evidence on the relationship between the increase in the size of these organizations and their performance.

**Methods:** A systematic review of the literature was carried out querying EMBASE, MEDLINE and Web of Science databases, from their inception to January 2020. Articles which quantitatively assessed outcomes and process indicators of merger/structural reorganization of primary care organizations and qualitative articles that assessed staff perception and satisfaction were included in the review. **Results:** A total of 3626 articles was identified and another study was retrieved through snowball search; 11 studies were included in the systematic review. Studies about lipid profile evaluation and emergency admissions for chronic conditions showed moderate evidence in supporting the merging of primary care organizations; conversely, clinical outcome studies did not reach a sufficient level of evidence to support merging actions. A moderate evidence of a negative effect on patient's perspective was found. **Conclusion:** Actually, there is no strong evidence in favour or against merging of primary care organizations without equivocation. This review supports the possibility to identify indicators for evaluating a merging process of primary care organizations and for adopting eventual remedies during this process. Further efforts should be made to identify additional indicators to assess merge actions among primary care organizations.

## Introduction

Primary care services represent the largest part of most people's experience of health care, providing the first point of contact in the healthcare system and acting as the 'front door' of the national health services (NHSs) (Box 1).<sup>1</sup> Traditionally, these services are provided by small organizations but many mergers and reconfigurations have taken place in recent years, increasing the size of the organizational units. Among the different forms of reorganizations, alliances are agreements between two or more firms to jointly manage assets and achieve strategic objectives.<sup>2</sup> They must be distinguished from merger and acquisitions, which refer to the combination of all assets of participating firms under a common ownership. This combination can refer to the merging of two more or less equal companies or acquisitions where one company obtains majority ownership over another company.<sup>3</sup>

Considering general organization, fusion is the dissolution of all existing organizations and transfer of all management prerogatives to a new successor organization specifically created for the purpose, whereas absorption represents the dissolution of at least one existing organization and transfer of all management prerogatives to another existing organization with similar function.<sup>4</sup>

Mergers could occur horizontally or vertically. In horizontal integration, organizations acquire or integrate with other ones that provide the same or similar services, whereas in vertical integration, organizations acquire or integrate with organizations offering different levels of care, services or functions.<sup>5</sup> Mergers can be broadly considered in terms of whether they merge voluntarily, 'bottom-up',

or are mandated, 'top-down'. However, the distinction between mandated and voluntary is not always clear-cut and it highly depends on the context.<sup>6</sup>

Historically, a number of mergers were observed among providers (e.g. hospitals). However, nowadays, mergers among payers and also insurances have been reported. The part of the organization that is in control of operations depends on the country and on its health system.<sup>7</sup>

The English NHS of the United Kingdom is paradigmatic of reorganizations of the commissioning function since the early 1990s.<sup>8,9</sup> Meanwhile, also new forms of 'large-scale' General Practitioner (GP)-led provider collaborations have evolved in England including multiple practices as federations, networks, joint ventures and alliances.<sup>6,10–12</sup>

In Canada, Primary Care Networks (PCNs) were established in 2005 and consisted of groups of family physicians and other health professionals working together, through a joint venture agreement between the provincial health authority (Alberta Health Services, AHS) and a group of family physicians who form a no-profit corporation.<sup>13–15</sup>

Policies for the amalgamation of the healthcare sector in Italy led to a substantial reduction in the number of Local Health Units (USLs) from 659, in 2012, to 101 Local Health Authorities (ASLs) in 2018.<sup>16</sup>

Mergers may change the way primary care organizations operate via the achievement of economic gains, economies of scale and scope through staff sharing and training, task shifting within the workforce and better integration of care. As a result, the delivery

of care might be affected by a reduction in unwarranted variations in clinical practice obtained by investing in technology, standardizing procedures, implementing best practice and adopting shared electronic records; moreover, an improvement in the access to core services can be reached by extending opening hours, implementing a wider skill-mix of staff and multidisciplinary team work, centralizing triage and managing patient overflow hubs.<sup>6,17,18</sup> There is the possibility that mergers could also result in worse access or quality of care. Although patients may value increased routes of access through scaling up, new access routes may not be well received by all patients and these routes can also result in poorer relational continuity of care with a consequent fragmentation of the healthcare services delivery. The above-mentioned leads to a lower patient satisfaction and a lower compliance to medical recommendations resulting in a decrease of clinical quality over time.<sup>6</sup>

On the other hand, economies of scale from merged institutions may not always exceed diseconomies of scale, which may arise because of new more complex governance and management processes.<sup>6</sup> Moreover, in the last decade, the Italian experience outlined as waiting lists have grown, response times for medical reports have raised, the distance between healthcare organizations has increased and the risk of political centralization has grown.<sup>19</sup>

The question of what size commissioning organizations should have to allow them to function most effectively is therefore highly relevant for local and national decision-makers. Several hypotheses about the relationship between size of commissioning organization and performance exist.<sup>8</sup> This review aims to summarize the literature evidence on the relationship between the increase in the size of organizations providing primary care services and their performance.

## Methods

### Study design and literature search

A systematic review of the literature was carried out querying the following electronic databases: EMBASE, MEDLINE, Web of Science, from their inception to January 2020, without language restrictions. The PICO process was used to frame the following guiding question of the systematic review: What is the relationship between the increase in size and the performance of a primary care organization? Each PICO domain corresponded to the following elements: (P) Primary care organizations, (I) merger or structural reorganization, (C) unmerged organizations and (O) performance of these organizations.<sup>20</sup> To ensure the systematic review quality, the Preferred Reporting Items for Systematic Reviews, and Meta-Analyses (PRISMA) check-list and flow diagram were used.<sup>21</sup> The search string was constructed combining keywords such as 'primary care organization', 'general practice', 'trust', 'merger', 'scale-up', 'reorganization', 'network', 'Outcome and Process Assessment', 'performance' and their synonyms through Boolean operators AND and OR. References of retrieved papers were also searched for additional studies.

### Study selection

Two investigators independently screened titles and abstracts of all records to identify potentially relevant publications. The inclusion criteria were: articles published in English, which quantitatively assessed outcomes and processes of primary care organizations that underwent a merger or structural reorganization and qualitative articles that assessed staff perception and satisfaction. Articles not meeting inclusion criteria were excluded; moreover, publications without original data (reviews, editorials or practice guidelines), articles which focused on comparison between single-handed practices and group practices and those that analysed exclusively functional reorganizations were excluded. The evaluation of the

eligibility criteria was performed independently by the two authors, and in case of divergence, a third researcher was consulted.

### Quality assessment

Two investigators assessed independently the quality of the studies using the National Institute of Health's Quality Appraisal Tool for Observational Cohort and Cross-Sectional Studies.<sup>22</sup> If disagreements occurred, final decision was reached by team consensus. The tool assessed 14 parameters: for each item, the investigator could select 'yes', 'no' or 'cannot determine/not reported/not applicable'. A potential risk of bias was considered if the item was rated as 'no' or 'cannot determine/not reported/not applicable' by the reviewer. Two items regarding the different levels of the exposure and the blinding of outcome assessors to the exposure status of participants were excluded; in studies that had no follow-up, item about loss to follow-up was not considered. If the 'yes' answers were  $\geq 75\%$  of the total, an article was considered of 'good' quality; if they were  $< 75\%$  but  $\geq 50\%$ , an article was scored as 'fair'; if they were  $< 50\%$ , the article was scored as 'poor'.<sup>23</sup>

### Data extraction and data analysis

Two reviewers performed data extraction independently and a standardized form was used to tabulate the following data: bibliographic details, country, study design, setting, aim of the study, outcomes analysed, comparator and main results.

The effect of the reorganization (merging) was evaluated by collecting the items that were analysed by the articles, categorizing them into three main groups: (i) Clinical outcomes, (ii) Clinical process measures and (iii) Patient's perspective. Only the items reported in at least two articles have been considered. The results were synthesized, to assess the strength of the evidence, according to three levels of scientific evidence for each category of items similarly to those developed by Hoogendoorn and colleagues.<sup>24</sup>

- Strong evidence: provided by generally consistent findings in multiple high-quality studies;
- Moderate evidence: provided by generally consistent findings in one high-quality study and one or more low-quality studies, or in multiple low-quality studies;
- Insufficient evidence: only one study available or inconsistent findings in multiple studies.<sup>24–26</sup>

Since Hoogendoorn et al.<sup>24</sup> used two levels of quality—high and low—to be conservative, a study was considered of high quality if the methodologic quality score was equal or higher than 75% (good) of the maximum score and of low quality if the methodologic score was lower than 75% of the maximum score (fair or poor). The findings of the studies were considered to be inconsistent if less than 75% of the available studies reported the same conclusion. In the case of multiple high-quality studies, the available low-quality studies were disregarded in the assessment of the level of evidence.

## Results

### Study selection

The literature search resulted in 3626 studies and another study was retrieved through snowball search method. After removing duplicates, the research team reviewed a total of 2417 manuscript titles and abstracts. A total of 41 full articles were considered potentially relevant; after full text examination, 30 of 41 articles were excluded, as they did not fulfil selection criteria. The remaining 11 studies were included in the systematic review and their quality assessment was performed (figure 1).

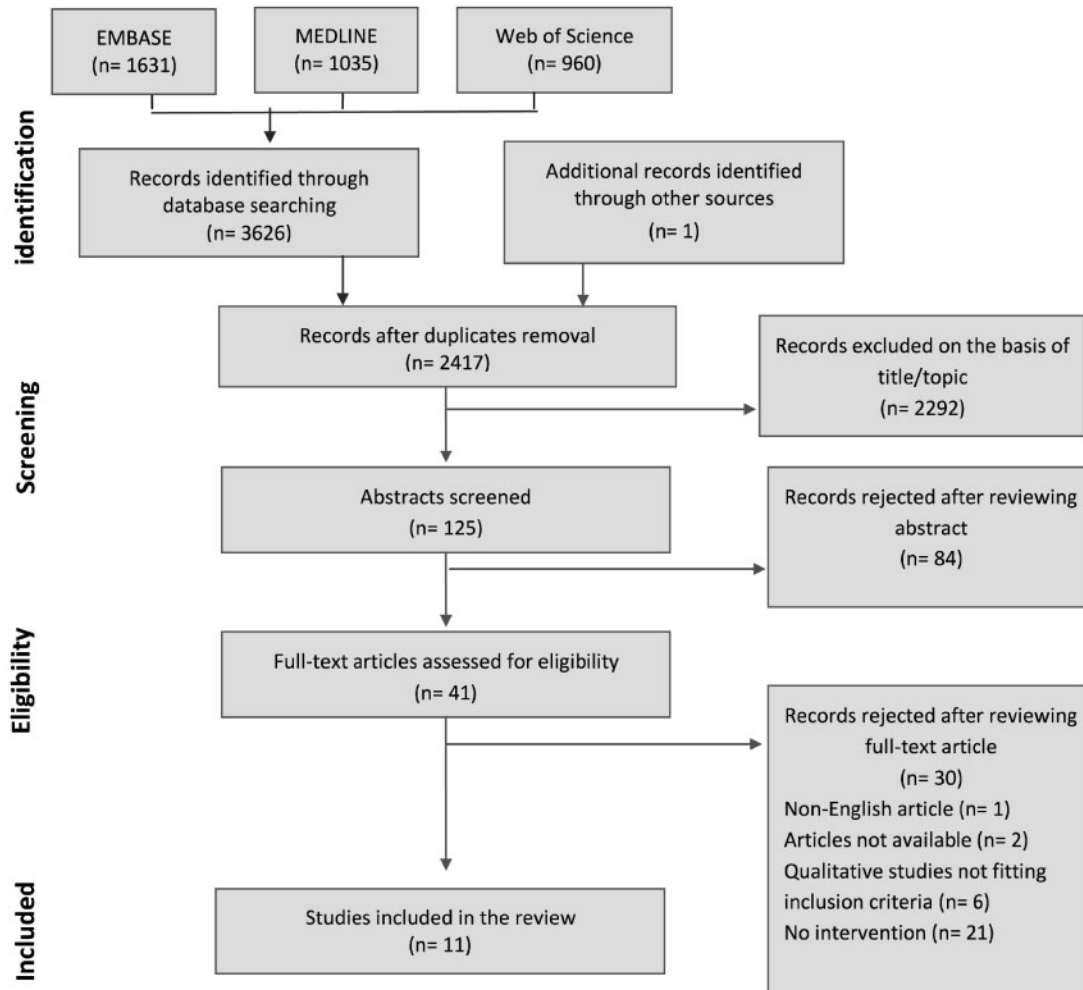


Figure 1 PRISMA flow diagram of the review process

### Characteristics of the studies

Nine of the included articles described cross-sectional studies<sup>8,14,27–33</sup> whereas two were about cohort studies<sup>14,34</sup> (table 1). The studies were published from 1996 to 2019 and were performed in England (eight studies) and in Alberta (Canada) (three studies). Four studies examined networks of general practice in the same London borough of Tower Hamlets, which was initiated by a horizontal and mandatory merging process. These studies assessed the performance of the networks using outcome and process indicators and comparing them with those of London and England.<sup>27–29,33</sup> Three papers analysed the impact of Alberta's PCNs, resulting from horizontal and mandatory merging processes: these studies explored the impact of the enrolment in PCNs for patient with type 2 diabetes and other chronic conditions on the admissions to hospital or visits to emergency departments and the perceptions of family physicians practicing in or not in PCN's team.<sup>14,15,34</sup> The remaining articles focused on the relationship between the size and performance of primary care organizations in England<sup>8,31</sup> and how practice's large list sizes impacted on consultation length, workload and availability<sup>30,32</sup>.

### Quality assessment

Out of 14, 11 parameters were deemed to be relevant (Supplementary table S1): a score of eight or greater was indicative of good methodological quality, six to seven was fair and studies scoring below six were deemed to be of poor quality. Overall methodological quality of all included studies ( $n = 11$ ) is summarized in table 1.

One study was deemed good quality, five were deemed fair quality and six studies were judged as poor, showing high risks of bias. The most frequently met quality criteria regarded research question/objective, study population, exposure measures and outcome measures. A number of items were rarely reported, including those relating to sample size justification, measure of exposure(s) of interest, timeframe between exposure and outcome (table 1).

### Levels of evidence

According to Hoogendoorn et al.<sup>24</sup> one study scored as high quality and other studies as low quality.

### Clinical outcomes

Three groups of clinical outcomes were identified:

**Levels of blood pressure.** Two low-quality studies<sup>8,27</sup> evaluated the levels of blood pressure. Only one paper<sup>27</sup> found a statistically significant positive effect of merged organizations on proportion of population with coronary heart disease (CHD), stroke, hypertension patients with blood pressure <150/90 mmHg. In all three domains, for blood pressure control, the London borough of Tower Hamlets improved faster than the rest of London and England. Application of the rating system has shown that there is insufficient evidence of an effect of merging on blood pressure, because of inconsistent findings (table 2).

**Levels of blood glucose in diabetes.** One high-quality<sup>15</sup> and one low-quality study<sup>8</sup> have analysed the levels of blood glucose in diabetes.

Table 1 Main characteristics of selected studies

| First Author | Publication year | Country | Type of study         | Type of organization                               | Aim of the study  | Outcomes   | Comparator   | Main results   | Quality score |
|--------------|------------------|---------|-----------------------|--|---|--|--|--|---------------|
| Greaves      | 2012             | England | Cross-sectional study | PCTs, Horizontal and mandatory merger              | To investigate whether there was a relationship between the size of commissioning organizations and how well they performed on a range of performance measures  | 36 indicators of commissioning performance, including measures of clinical and preventative effectiveness, patient centeredness, access, cost, financial ability and engagement  | Large PCTs vs. small PCTs  | This study showed a link between commissioning organization size and some areas of performance but observed variations in PCT performance were not explained by the size but rather by the characteristics of the populations they served.   | Fair          |
| Manns        | 2012             | Canada  | Cohort study          | PCNs, Horizontal and mandatory merger              | To determine the impact of Alberta's primary care networks on measures of processes   | <ul style="list-style-type: none"> <li>i. Admission to hospital or visits to emergency departments for diabetes-specific ambulatory care sensitive conditions</li> <li>ii. Proportion of patients who underwent guideline-recommended laboratory investigations</li> <li>iii. Use of medications among patients aged 66 years and older</li> <li>iv. Outpatient visits to primary care physicians or specialist in internal medicine</li> <li>v. Proportion of patients who saw an ophthalmologist or optometrist</li> </ul> | Patients managed in PCNs vs. patients not managed in PCNs  | The care received by patients with diabetes in the PCNs was associated with more use of guideline-recommended screening and a lower rate of admissions to hospital or visits to emergency departments for diabetes-specific ambulatory care sensitive conditions. However, the observed absolute changes were small, and the observational nature of the data did not permit to establish causality. | Good          |
| Robson       | 2014             | England | Cross-sectional study | General practices, Horizontal and mandatory merger | To evaluate cardiovascular disease managed practice networks in one entire local health economy using practice networks, compared with PCTs in London, England, and local PCTs.   | <ul style="list-style-type: none"> <li>i. Lipid lowering prescribing</li> <li>ii. Proportion of coronary heart disease patients with blood pressure &lt; 150/90 mmHg</li> <li>iii. Proportion of coronary heart disease patients with cholesterol &lt; 5 mmol/L</li> <li>iv. Myocardial infarction mortality in patients aged &lt; 75 years per 100 000 directly standardized</li> </ul>   | 36 practices grouped geographically into eight networks of 4-5 practices vs. PCTs in London, England and local PCTs. | Managed geographical practice networks delivered a step-change in key cardiovascular disease performance indicators in comparison with England, London, or similar PCT/CCGs.   | Poor          |
| Cockman      | 2011             | England | Cross-sectional study | General practices, Horizontal and mandatory merger | To evaluate improvements of vaccination rates in the networks of general practices of Tower Hamlets   | <ul style="list-style-type: none"> <li>i. Rates for childhood vaccinations for MMR1</li> </ul>   | 36 practices grouped geographically into eight networks of 4-5 practices vs. PCTs in London, England and local PCTs. | The development of networks of practices facilitated collaborative working among primary care clinicians and other stakeholders improving MMR vaccination.   | Fair          |
| Hull         | 2014             | England | Cross-sectional study | General practices, Horizontal and mandatory merger | This project evaluated an example of system change involving the formation of networks of general practices tasked with collectively delivering an agreed care package for type 2 diabetes, with the aim of achieving a step-change in improvement in clinically important indicators of diabetes management. | <ul style="list-style-type: none"> <li>i. Care plans completed (target: 90%)</li> <li>ii. Proportion of patients attending for digital retinal screen (target: 80%)</li> <li>iii. Proportion of patients achieving defined total cholesterol and blood pressure (target: 50%)</li> <li>iv. Population average glycated haemoglobin of 7.5%</li> </ul>  | 36 practices grouped geographically into eight networks of 4-5 practices vs. PCTs in London, England and local PCTs. | Investment of financial, organizational and education resources into networks of general practices could achieve clinically important improvements in diabetes care in deprived, ethnically diverse communities.   | Fair          |

(continued)

Table 1 Continued

| First Author | Publication year | Country | Type of study         | Type of organization                               | Aim of the study  | Outcomes  | Comparator   | Main results   | Quality score |
|--------------|------------------|---------|-----------------------|--|---|---|--|--|---------------|
| Hull         | 2014             | England | Cross-sectional study | General practices. Horizontal and mandatory merger | Evaluation of a system change to enhance COPD care delivery in a primary care setting between 2010 and 2013 using observational data.   | <ul style="list-style-type: none"> <li>i. COPD register size</li> <li>ii. Care plans completed</li> <li>iii. Pulmonary rehabilitation referral</li> <li>iv. Hospital admission</li> </ul>   | 36 practices grouped geographically into eight networks of 4–5 practices vs. PCTs in London, England and local PCTs. | Improvements in COPD primary care in a socially deprived, ethnically diverse locality were observed over a 3-year period following financial and organizational investment into general practice networks.   | Poor          |
| Szafran      | 2019             | Canada  | Cross-sectional study | PCNs. Horizontal and mandatory merger              | To examine the extent to which family physicians routinely collaborated with other health professionals in the care of patients with type 2 diabetes, comparing those who were part of an inter-professional primary care team (PCN) to those who were not (non-PCN). | <ul style="list-style-type: none"> <li>i. Physician satisfaction and confidence with other professionals' involvement in the care of diabetes</li> <li>ii. -Factors contributing to dissatisfaction</li> <li>iii. -Referral to and collaborative arrangements with other health professionals</li> <li>iv. Physician perceptions of the effect of having other health professionals involved in medication management of diabetic patients</li> </ul>   | Physicians in PCN vs. physicians who did not take part in a PCN  | The study findings revealed that family physicians who were affiliated with a PCN reported involving other health professionals in the care of patients with type 2 diabetes to a greater degree than family physicians who were not part of a PCN.  | Poor          |
| Campbell     | 2001             | England | Cross-sectional study | General practices. Horizontal and mandatory merger | Evaluation of variations in markers of the structure, process and outcome of the care being provided by practices of various sizes  | <ul style="list-style-type: none"> <li>i. Average consultation length</li> <li>ii. GPAS (accessibility, receptionist performance, continuity)</li> <li>iii. Practice performance score</li> <li>iv. Projected routine annual consultation rate</li> </ul>   | Large practices vs. small practices  | Smaller practices had shorter average consultation lengths and reduced practice performance scores than larger practices. Smaller practices had perceived improved accessibility of care and receptionist performance, better continuity of care than larger practices and no disadvantage in relation to 10 other dimensions of care. | Poor          |
| McAlister    | 2018             | Canada  | Cohort study          | PCNs. Horizontal and mandatory merger              | To examine whether patients of PCNs had fewer visits to the emergency department and acute care hospital admissions than patients cared for by primary care physicians who were not affiliated with a PCN.  | <ul style="list-style-type: none"> <li>i. Proportion of patients having an emergency department visit</li> <li>ii. Proportion of patients having an emergency department visit for indicator conditions</li> <li>iii. Proportion of patients having hospital admissions</li> <li>iv. Proportion of patients having hospital admissions for indicator conditions</li> <li>v. Hospital length of stay for those hospitalized</li> <li>vi. 30-day readmission rates after hospital discharge</li> <li>vii. 30-day repeat emergency department visit</li> </ul> | Patients managed in PCN vs. patients not managed in PCNs   | Care within a PCN was associated with fewer emergency department visits and fewer hospital days.   | Fair          |

(continued)

Table 1 Continued

| First Author | Publication year | Country | Type of study         | Type of organization                               | Aim of the study  | Outcomes   | Comparator                          | Main results  | Quality score |
|--------------|------------------|---------|-----------------------|--|---|--|-------------------------------------|---|---------------|
| Wilkin       | 2003             | England | Cross-sectional study | PCG, PCT, Horizontal and mandatory merger          | To examine the relationship between size and performance of primary care organizations, the effect of merger and the reasons for merger                           | i. 22 Performance measures   | Large PCGs/PCTs vs. small PCGs/PCTs | There was a little evidence that the performance or efficiency of a primary care organization was associated with its size. In only 2 of 22 cases was size, as measured by population, significantly associated with performance.   | Poor          |
| Campbell     | 1996             | England | Cross-sectional study | General practices, Horizontal and mandatory merger | To investigate the availability of general practitioners as reported by their patients and the relationship between reported availability and practice list size. | i. Perceived doctor availability<br>ii. Percentage of patients reporting practice meets target for urgent or non-urgent availability | Large practices vs. small practices | This study suggested that smaller practice list sizes had advantages with regard to patients' perceptions of their doctor's availability. A significant negative association was demonstrated between combined practice list size and reported non-urgent or urgent availability. | Fair          |

PCT, Primary Care Trust; PCG, Primary Care Group; PCN, Primary Care Network; CCG, Clinical Commissioning Group; MMR, measles, mumps and rubella; COPD, chronic obstructive pulmonary disease.

Table 2 Findings of the impact of merging interventions by selected category

| Category                                    | Reference                                   | Result                 | Evidence     |
|---|---|------------------------|--------------|
| Clinical outcomes                           |   |                        |              |
| Blood pressure levels                       | Greaves<br>Robson                           | n.s.<br>+              | Insufficient |
| Blood glucose levels                        | Greaves<br><b>Manns</b>                     | n.s.<br>+              | Insufficient |
| Clinical process measures                   |   |                        |              |
| Lipid profile                               | Greaves<br><b>Manns</b><br>Robson           | -<br>+<br>+            | Moderate     |
| Emergency admissions for chronic conditions | Greaves<br><b>Manns</b>                     | +<br>+                 | Moderate     |
| Vaccination coverage                        | McAlister<br>Greaves<br>Campbell<br>Cockman | +<br>n.s.<br>n.s.<br>+ | Insufficient |
| Patient's perspective                       |   |                        |              |
| Ability to see a doctor fair quickly        | Greaves                                     | +                      | Moderate     |
| Satisfaction with opening hours             | Greaves                                     | -                      |              |
| Accessibility                               | Campbell                                    | -                      |              |
| Continuity of care                          | Campbell                                    | -                      |              |
| Perceived availability                      | Campbell                                    | -                      |              |

+, statistically significant results in favour of the intervention; n.s., not statistically significant results; -, statistically significant results in opposition of the intervention. Good quality studies are in **bold**. Levels of evidence: Strong, Moderate, Insufficient.

In the latter, the proportion of people affected by diabetes with HbA1c  $\leq 8\%$ <sup>2</sup> showed no significant correlation with population size. A statistically significant positive effect of PCN of Alberta was found on mean glycated haemoglobin of patients affected by diabetes cared for in PCNs compared to patients cared for outside PCNs. Therefore, application of the rating system has shown an insufficient evidence because of inconsistent findings (table 2).

In summary, studies dealing with level of blood pressure or levels of blood glucose have shown insufficient evidence in supporting a merging intervention among primary care organizations.

### Clinical process measures

*Lipid profile monitoring.* One high-quality study<sup>15</sup> and two low-quality studies<sup>8,27</sup> reported process measures of lipid profile. All results were statistically significant, but Greaves et al.<sup>8</sup> found that bigger PCTs had a statistically significant negative effect on rates of generic statin prescribing. Because one high- and one low-quality study indicated a positive effect of merging, application of the rating system has shown that there is a moderate evidence (table 2).

*Emergency admissions for chronic conditions.* The effect of merging on emergency admission was reported in one high-<sup>15</sup> and two low-quality studies.<sup>8,34</sup> Results in all studies showed that increase in size of population had a statistically significant positive effect. In Alberta, those who received care in primary care networks were less likely to visit an emergency department for a diabetes-specific ambulatory care sensitive condition than those whose care was not managed in a network. Because findings in three studies, one of high and two of low quality indicated a positive effect (in terms of reduction of emergency department accesses), application of the rating system reached moderate level of evidence (table 2).

*Vaccination coverage.* Vaccination coverage included several vaccines and different age groups. Three low-quality articles<sup>8,30,33</sup> addressed the topic and just one indicator showed a statistically significant positive effect of merging on MMR1 vaccine in Tower Hamlets. After the intervention, the uptake increased by 1.86% every quarter from the third quarter of 2009. However, the rating

system assigned insufficient evidence because of inconsistent findings (table 2).

In summary, studies focusing on lipid profile evaluation and emergency admissions for chronic conditions have shown moderate evidence in supporting a merging process in primary care organizations; oppositely, analysis of papers dealing with vaccination coverage did not reach a sufficient level of evidence to support merging actions between primary care organizations.

*Patient's perspective.* Three low-quality studies<sup>8,30,32</sup> examined the relationship between merging and patient's perspective. One indicator (ability to see a doctor fairly quickly) had a significant positive correlation with bigger PCT in only one study. The remaining ones (satisfaction with opening hours, accessibility, continuity of care and perceived availability for urgent and non-urgent conditions) showed a statistically significant negative effect. Rating system assigned a moderate evidence to the negative effect of merging on patient's perspective (table 2).

In summary, studies dealing with patient's perspective have shown a moderate evidence of a negative effect after a merging intervention among primary care organizations.

## Discussion

The main purpose of this systematic review was to evaluate the literature evidence on the relationship between the increase in the size of organizations providing primary care services and their performance. There is moderate evidence that merging primary care organizations produces better results in terms of prescribing and in-taking of lipid lowering drugs and reduced emergency admissions for chronic conditions.<sup>35</sup> The above-mentioned improvement may be related to financial, organizational and socio-cultural reasons; moreover, another reason may be the opportunity for physicians of merged organizations to work in teams. Szafran et al.<sup>14</sup> provided additional data on family physicians' positive perceptions of inter-professional collaboration and on the influence that being part of a PCN had on their practice. Regarding the vaccination coverages and the clinical outcomes, according to the rating system there is insufficient evidence even if the findings are promising.

Despite the expected changes, merged organizations showed lower satisfaction with opening hours, accessibility, continuity of care and perceived availability for urgent and non-urgent conditions by patients than unmerged ones, with moderate level of evidence. Furthermore, Wilkin et al.<sup>31</sup> showed that only two performance measures were significantly associated with size as initiatives to extend the range of services available in primary and intermediated care.

In relation to the improvement of the number of population, Baker et al.<sup>36</sup> found that it could improve quality processes but may increase staff turnover, causing problems for continuity of care and challenges. In addition, other factors influencing performance include availability of resources, quality of clinical leadership and pre-existing relationships in the local context where merge occurs.<sup>37</sup> Finally, concerning the economical and organizational aspects, the expected economies of scale from larger organizations may not always outweigh diseconomies of scale which may emerge due to new more complex governance and management processes.<sup>6</sup>

A few studies were not included in the analysis due to the impossibility of verifying the statistical significance of the results. Particularly, in one study<sup>28</sup> the outcomes for patients with type 2 diabetes (e.g. digital retinal screen) improved as well as the outcomes for patients with chronic obstructive pulmonary disease (COPD) (e.g. reduction in hospital admissions) in the second study.<sup>29</sup>

Currently, there is no strong evidence in favour or against merging of primary care organizations without equivocation. It is suggested to use a set of indicators to evaluate a merging process of primary care organizations. There is evidence in the literature

reporting the availability of several sets of indicators as those provided by the European Commission,<sup>38–40</sup> among which some indicators adopted for this study were found. Indeed, tools aimed at assessing how primary care contributes to health system and satisfies the dimensions of relevance, accessibility, integration, person-centeredness, affordability, equity, sustainability, workload and workforce satisfaction are essential to inform policy-makers and facilitate the decision-making process.

Nevertheless, lack of a right planning and of a suitable timetable can delay the integration process. In Italy, between 2015 and 2016, three large ASLs were created in Tuscany from an institutional merger of 12 pre-existing organizations: the transitional phase lasted eight months<sup>41</sup> also because there were different processes and IT platforms in the merged institutions, which caused delays. Moreover, the time and resources spent for reorganization to establish a merger could be underestimated, and the anticipated benefits could not occur<sup>37</sup> or could occur partially. Therefore, there is the need of defined indicators to assess, based on their performance, remedial actions.

The phenomenon of 'merger-mania' seems to last, especially in these years characterized by spending review, since it is the most suitable shortcut to cut costs in healthcare. The core message of this study is not to focus on the reasons to 'perform' or to 'avoid merger' but, on the contrary, on the planning of merger activities and on the cyclical evaluation, with the proper accountability tools, to give robustness to health policy choices.

The strengths of this review include a robust systematic process for search strategy, appraisal, data extraction and description, supplemented with hand searching and forward citation searching. Full search methodology and strict inclusion criteria have improved the relevance of the reviewed articles that dealt with horizontal and mandatory mergers, but their small number and their origin (two geographic areas) limit the generalizability of findings. A large heterogeneity was found in the indicators and results highlighted by the selected studies. Not least, high heterogeneity in the methodology of studies and in measures used to evaluate results with an overall variable follow-up duration (from months to years) hindered the possibility to undertake a quantitative analysis through a formal meta-analysis. Additionally, it should be pointed out that the methodology of the rating system overrides good quality studies and puts more weight on papers of less quality.

This paper has only looked at the (increase in) size of primary care organizations and not at the (new) structure of the merged organizations; besides, this study does not deal with mergers of GPs into primary care teams that provide multi-professional services for patients, particularly those with chronic conditions, which are still desirable and already evaluated in other studies.<sup>42,43</sup>

Although it is important to examine which types of organizations end up being merged, before-after studies, focusing on whether the pre-merger level of primary care performance may influence whether an organization will end up merging with another, were not found. Moreover, the results cannot always be applied to all the different primary care organizations: firstly, because included studies considered only mandatory and horizontal mergers occurred among providers and, secondly, due to the presence of many confounders on performance of NHS's primary care organizations as, for instance, reimbursement system, provision of incentives, multidisciplinary disease management programs and integrated care. Evidence-based policy ensures that the best interventions are effectively implemented. Policy decisions are invariably weakened when they do not take account of the best current knowledge. There are a number of reasons why policy decisions may not be evidence-based. The difficulty of taking evidence-based decisions is due to the lack of already established evidence. In addition, policy-makers are unwilling or unable to take account of good existing evidence and academics do not produce rigorous/relevant papers within the time-frame of the policy cycle. Getting relevant science and research into

policy is essential. There are several barriers, but the easiest way to reduce them is making scientific literature more relevant and accessible to policymakers.<sup>44</sup>

There is no strong evidence that favours or discourages undertaking primary care organizations merging. Policy-makers and stakeholders should take into account economic, organizational, healthcare outcomes but there is currently little research to indicate with confidence that the expectations on mergers will be met, or to identify the potential unintended consequences. Further studies are needed to evaluate cost-efficacy and equity of a merging process between primary care organizations. The evaluations of the impact of mergers have to be related to the context and setting in which they will take place and, moreover, there is the need to plan and perform adequate designed studies to follow the impact and outcome of mergers in order to confirm and better explain the results obtained by our study. We have planned to conduct a study about the merger performed in Sardinia, considering some indicators and evaluating their trend over time; in this way, a join point regression analysis should explain the trend of those indicators and is able to detect the time point(s) when the trend significantly changes and estimate the regression function with join point(s) previously identified.<sup>45</sup>

## Supplementary data

Supplementary data are available at *EURPUB* online.

## Funding

The authors received no specific funding for this work.

*Conflicts of interest:* None declared.

### Box 1 Abbreviations used

|        |  |
|--------|--|
| AHS    | Alberta Health Services  |
| ASLs   | Local Health Authorities   |
| CCG    | Clinical Commissioning Group                                       |
| CHD    | Coronary heart disease   |
| COPD   | Chronic obstructive pulmonary disease                              |
| GP     | General Practitioner   |
| HbA1c  | Glycated haemoglobin   |
| MMR1   | First dose of measles, mumps and rubella vaccine                   |
| NHS    | National Health System   |
| PCG    | Primary Care Group   |
| PCN    | Primary Care Network   |
| PCT    | Primary Care Trust   |
| PRISMA | Preferred Reporting Items for Systematic Reviews and Meta-Analyses |
| USLs   | Local Health Units   |

### Key points

- Merging processes could improve quality processes but may increase staff turnover, causing problems for continuity of care and challenges.
- It is better to assess periodically and systematically the impact of mergers in a continuous quality improvement cycle.
- This review supports the identification of indicators for evaluating a merging process of primary care organizations and for adopting eventual remedies during this process.

## References

- 1 Newell F. Framework for patient and public participation in primary care commissioning. NHS England, 2016. Available at: <https://www.england.nhs.uk/commissioning/wp-content/uploads/sites/12/2016/03/framwrk-public-partcptn-prim-care.pdf> (15 April 2020, date last accessed).
- 2 Yin X, Shanley M. Industry determinants of the “merger versus alliance” decision. *Acad Manage Review* 2008;33:473–91.
- 3 Hagedoorn J, Duysters G. External sources of innovative capabilities: the preference for strategic alliances or mergers and acquisitions. *J Manage Stud* 2002;39:167–88.
- 4 Starkweather DB. Health facility mergers: some conceptualizations. *Med Care* 1971;9:468–78.
- 5 Heeringa J, Mutti A, Furukawa MF, et al. Horizontal and vertical integration of health care providers: a framework for understanding various provider organizational structures. *Int J Integr Care* 2020;20:2.
- 6 Pettigrew LM, Kumpunen S, Rosen R, et al. Lessons for ‘large-scale’ general practice provider organisations in England from other inter-organisational healthcare collaborations. *Health Policy* 2019;123:51–61.
- 7 Gal-Or E. Mergers and exclusionary practices in health care markets. *J Econ Manage Strategy* 1999;8:315–50.
- 8 Greaves F, Millett C, Pape UJ, et al. Association between primary care organisation population size and quality of commissioning in England: an observational study. *Br J Gen Pract* 2012;62:e46–54.
- 9 Procedures for clinical commissioning groups to apply for constitution change, merger or dissolution. NHS England, 2019. Available at: <https://www.england.nhs.uk/wp-content/uploads/2019/04/procedures-for-clinical-commissioning-groups-to-apply-for-constitution-change-merger-dissolution-aug-2020.pdf> (06 January 2021, date last accessed).
- 10 British Medical Association. Collaborative GP networks. Guiding principles for GP networks – June 2015. Available at: <http://www.gpone.wales.nhs.uk/sitesplus/documents/1000/GP%20Networks%20Guidance%20-%20Guiding%20principles%20for%20GP%20Networks%20-%20June%202015.pdf> (15 April 2020, date last accessed).
- 11 British Medical Association. Collaborative GP networks. Guidance for GPs on the basic legal structures – January 2015. Available at: <https://www.bma.org.uk/advice/employment/gp-practices/gps-and-staff/gp-networks/basic-legal-structures> (15 April 2020, date last accessed).
- 12 British Medical Association. Collaborative GP networks. A step-by-step guide to setting up a GP network – March 2015. Available at: <https://www.bma.org.uk/advice-and-support/gp-practices/primary-care-networks/how-to-create-and-run-a-primary-care-network> (15 April 2020, date last accessed).
- 13 Government of Alberta, Alberta Medical Association, Alberta Health Services. Primary Care Initiative. Policy Manual. Version 11. 2008 (updated January 2018). Available at: <https://www.pcnpmo.ca/access/Documents/PCN%20Policy%20Manual.pdf> (15 April 2020, date last accessed).
- 14 Szafran O, Kennett SL, Bell NR, Torti JMI. Interprofessional collaboration in diabetes care: perceptions of family physicians practicing in or not in a primary health care team. *BMC Fam Pract* 2019;20:44.
- 15 Manns BJ, Tonelli M, Zhang J, et al. Enrolment in primary care networks: impact on outcomes and processes of care for patients with diabetes. *CMAJ* 2012;184:E144–52.
- 16 Ministero della Salute “Elenco Aziende Sanitarie locali e Strutture di Ricovero”. Direzione generale della digitalizzazione, del sistema informativo sanitario e della statistica - Ufficio II - Direzione statistica. Nuovo Sistema Informativo Sanitario (NSIS). Available at: [http://www.salute.gov.it/portale/documentazione/p6\\_2\\_8\\_1\\_1.jsp?id=13](http://www.salute.gov.it/portale/documentazione/p6_2_8_1_1.jsp?id=13) (15 April 2020, date last accessed).
- 17 Fulop N, Protopsaltis G, Hutchings A, et al. Process and impact of mergers of NHS trusts: multicentre case study and management cost analysis. *BMJ* 2002;325:246.
- 18 Fulop N, Protopsaltis G, King A, et al. Changing organisations: a study of the context and processes of mergers of health care providers in England. *Soc Sci Med* 2005;60:119–30.
- 19 OFCS report. Riforma sanità, fusione selvaggia delle Asl: entro il 2017 saranno solo 97. Available at: <https://ofcs.report/internazionale/difesa-e-sicurezza-nazionale/riforma-sanita-fusione-selvaggia-delle-asl-entro-il-2017-saranno-solo-97/#gsc.tab=0> (24 November 2020, date last accessed).
- 20 Richardson WS, Wilson MC, Nishikawa J, Hayward RS. The well-built clinical question: a key to evidence-based decisions. *ACP J Club* 1995;123:A12–3.



- 21 Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *Ann Intern Med* 2009; 151:264–9.
- 22 National Institutes of Health. Quality Assessment tool for Observational Cohort and Cross-Sectional Studies. Available at: <https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools> (15 April 2020, date last accessed).
- 23 Sommer AE, Golden BP, Peterson J, et al. Hospitalized patients' knowledge of care: a systematic review. *J Gen Intern Med* 2018;33:2210–2229.
- 24 Hoogendoorn WE, van Poppel MN, Bongers PM, et al. Systematic review of psychosocial factors at work and private life as risk factors for back pain. *Spine (Phila Pa 1976)* 2000;25:2114–25.
- 25 Damiani G, Silvestrini G, Federico B, et al. A systematic review on the effectiveness of group versus single-handed practice. *Health Policy* 2013;113:180–7.
- 26 Massimi A, De Vito C, Brufola I, et al. Are community-based nurse-led self-management support interventions effective in chronic patients? Results of a systematic review and meta-analysis. *PLoS One* 2017;12:e0173617.
- 27 Robson J, Hull S, Mathur R, Boomla K. Improving cardiovascular disease using managed networks in general practice: an observational study in inner London. *Br J Gen Pract* 2014;64:e268–74.
- 28 Hull S, Chowdhury TA, Mathur R, Robson J. Improving outcomes for patients with type 2 diabetes using general practice networks: a quality improvement project in east London. *BMJ Qual Saf* 2014;23:171–6.
- 29 Hull S, Mathur R, Lloyd-Owen S, et al. Improving outcomes for people with COPD by developing networks of general practices: evaluation of a quality improvement project in east London. *NPJ Prim Care Respir Med* 2014;24:14082.
- 30 Campbell JL, Ramsay J, Green J. Practice size: impact on consultation length, workload, and patient assessment of care. *Br J Gen Pract* 2001;51: 644–50.
- 31 Wilkin D, Bojke C, Coleman A, Gravelle H. The relationship between size and performance of primary care organisations in England. *J Health Serv Res Policy* 2003;8:11–7.
- 32 Campbell JL. The reported availability of general practitioners and the influence of practice list size. *Br J Gen Pract* 1996;46:465–8.
- 33 Cockman P, Dawson L, Mathur R, Hull S. Improving MMR vaccination rates: herd immunity is a realistic goal. *BMJ* 2011;343:d5703–d5703.
- 34 McAlister FA, Bakal JA, Green L, et al. The effect of provider affiliation with a primary care network on emergency department visits and hospital admissions. *CMAJ* 2018;190:E276–84.
- 35 Ludwick DA. Primary care networks: Alberta's primary care experiment is a success—now what? *Healthc Q* 2011;14:7–8.
- 36 Baker R, Willars J, McNicol S, et al. Primary care quality and safety systems in the English National Health Service: a case study of a new type of primary care provider. *J Health Serv Res Policy* 2014;19:34–41.
- 37 Pettigrew LM, Kumpunen S, Mays N, et al. The impact of new forms of large-scale general practice provider collaborations on England's NHS: a systematic review. *Br J Gen Pract* 2018 Mar;68:e168–77.
- 38 Ramalho A, Castro P, Gonçalves-Pinho M, et al. Primary health care quality indicators: an umbrella review. *PLoS One* 2019;14:e0220888.
- 39 McColl A, Roderick P, Gabbay J, et al. Performance indicators for primary care groups: an evidence based approach. *BMJ* 1998;317:1354–60.
- 40 Tools and methodologies for assessing the performance of primary care. Report of the Expert Panel on effective ways of investing in Health (EXPH). Available at: [https://ec.europa.eu/health/sites/health/files/expert\\_panel/docs/opinion\\_primary\\_care\\_performance\\_en.pdf](https://ec.europa.eu/health/sites/health/files/expert_panel/docs/opinion_primary_care_performance_en.pdf) (18 September 2020, date last accessed).
- 41 Romiti A, Del Vecchio M, Grazzini M. Models for governing relationships in healthcare organizations: some empirical evidence. *Health Serv Manage Res* 2018;31: 85–96.
- 42 Damiani G, Silvestrini G, Federico B, Cosentino M, Marvulli M, Tirabassi F, Ricciardi W. A systematic review on the effectiveness of group versus single-handed practice. *Health Policy* 2013;113:180–7.
- 43 Visca M, Donatini A, Gini R, et al. Group versus single handed primary care: a performance evaluation of the care delivered to chronic patients by Italian GPs. *Health Policy* 2013;113:188–98.
- 44 Whitty CJ. What makes an academic paper useful for health policy? *BMC Med* 2015;13:301.
- 45 Kim H-J, Fay MP, Feuer EJ, Midthune DN. Permutation tests for joinpoint regression with applications to cancer rates. *Stat Med* 2000;19:335–51.