

# Perspectives in Public Health

## Special issue: Arts and Health

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VISION, VOICE AND PRACTICE

# In Practice

## Mindsong – music therapy for dementia: music therapy during the Covid-19 pandemic

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### BACKGROUND

Mindsong is a charity specialising in supporting people with dementia and their carers through a range of music interventions based in Gloucestershire, in the UK.

This article focuses on our Music Therapy at Home (MT@H) service and describes how it has survived and thrived during the pandemic, illustrated with quotations from family carers.

Music Therapy is a clinical intervention provided by qualified, Health and Care Professions Council (HCPC)–registered therapists who aim to support emotional and psychological wellbeing for people with varying health conditions through music and song. Using techniques such as improvisation, songwriting, active listening or singing familiar songs, therapists engage with another person in a highly personalised way. For people with dementia, music therapy can achieve positive effects on communication, engagement, stimulation, mood,

relationships and a sense of identity.<sup>1</sup> A growing body of research suggests that it is an effective intervention for later-stages of dementia, supporting wellbeing and quality of life.<sup>2–4</sup> Music Therapy is also recommended in the UK NICE Guidelines for dementia.<sup>5</sup>

Mindsong's Music Therapy at Home service was conceived in 2016 as a co-production with our local NHS Clinical Commissioning Group (CCG), who continue to provide support. The service is for people living at home with later-stage or complex dementia who are being cared for by a family member. Our music therapists provide support for the family carer as well as the person with dementia, helping to reduce stress and improve quality of life for both.<sup>1</sup> Part of the therapy is the development of personalised music strategies to support daily care and wellbeing outside session times, for example, during mealtimes or when completing personal care.<sup>1,6</sup>

We receive referrals from local Community Dementia Nurses, Later Life Mental Health Teams, GPs, Alzheimer's Society Dementia Advisers and self-referrals. Despite the pandemic, in 2020, we saw our busiest year to date, working with 78 different families in Gloucestershire.

**Music Therapy is a clinical intervention provided by qualified, Health and Care Professions Council (HCPC)–registered therapists who aim to support emotional and psychological wellbeing for people with varying health conditions through music and song**

by one of our Carer Supporters, all of whom have previous clinical experience in healthcare and receive



ongoing training and support from Mindsong. They assess the situation by talking with the carer about the particular challenges and difficulties they face and completing a baseline evaluation form which measures the impact of caring on their daily life. This is called a Carer Dementia Quality of Life measure (C-DEMqoL<sup>7</sup>). The possible aims and outcomes of music therapy are discussed, and informed consent is gained from all parties. The carer may be asked to make a decision on behalf of the person with dementia.

Once this has been agreed, Mindsong offers 12 weekly sessions in the family home, funded by Mindsong and Gloucestershire NHS CCG. Sessions usually last about an hour and are tailored to meet the couple's needs. Sometimes, other family members or friends also join in.

### IMPACT OF COVID-19 PANDEMIC

These have been extremely challenging times for people with dementia and their carers.<sup>8–10</sup> Services such as respite care, community support groups and personal care were suddenly halted. Medical consultations were held online and in many cases, friends and family could no longer visit. Deterioration of care home residents due to social isolation has been widely reported in the press, but equally affected

those with dementia living in the community. Family carers struggled with the extra pressures of trying to cope alone, and despite some improvements over the year as services began to adapt, for many families, the situation remains little changed.

Mindsong's MT@H service has never been more essential, and we worked within restrictions to continue our work throughout the pandemic. As one carer observed,

*It was the first positive response from an organisation – others withdrew due to Covid.*

Initially offering therapy online or over the phone, in April 2020, we gained agreement from the local Dementia Commissioner and Gloucestershire Police for our therapists to travel and deliver Music Therapy outdoors. Sessions took place in people's gardens, driveways or on front doorsteps, and this was greatly valued by carers:

*No-one else would come in ... (the therapist) came and sat in the doorway.*

As autumn arrived, we moved inside, wearing personal protective equipment and adhering to strict safety guidelines to minimise the risk of transmission. We have continued indoor, outdoor and

online sessions throughout the three lockdowns, providing much-needed social, psychological and practical support.

### EVALUATION OF IMPACT

Mindsong attaches great importance to understanding the impact of our services. Carer feedback is considered to be highly significant, and we continue to review our evaluation methods to improve our understanding of their experience and the outcomes of music therapy.

Our Carer Supporters play a crucial role in evaluating the therapy, conducting an interim phone call halfway through and a further evaluation when the 12 sessions are complete. This allows the carer to describe any effects of the music therapy, both for themselves and their relative.

Analysis of carer comments consistently shows benefits to communication and family relationships, mild to marked improvement in a variety of dementia symptoms and increased general wellbeing for all parties:

**Family and friends may visit more often when they find that singing is an easy and enjoyable way of reconnecting and spending time together**

*Music lifts him to a time when problems didn't exist.*

*Mindsong has been life-changing. It's been absolutely brilliant for Mum and the family.*

Sometimes these benefits extend to wider family and social networks, leading to strengthened relationships, more support, and reduced isolation and loneliness. For instance, family and friends may visit more often when they find that singing is an easy and enjoyable way of reconnecting and spending time together. Feedback from our newly established online Carers' Forum illustrates how the much support

of Mindsong was valued:

*The feeling that 'I mattered' for the first time – that meant so much – it really carried me through those difficult times.*

For more information, please visit our website: [mindsong.org.uk](https://mindsong.org.uk)

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**Music for Life. A Spanish project for improving quality of life and prevention of dementia through music participation.**

The improvement in social conditions and advances in healthcare in the Western world has dramatically increased life-expectancy. The fact that a high percentage of the Spanish population is older, creates a new situation in which resources are increasing for older people thus developing a diversity of initiatives aimed at improving the lives of older people both in the present and in the future (Pérez, 2006, López, 2004).

There is a growing research evidence in diseases such as Parkinson's, Alzheimer's and cerebral stroke that engaging with music produces a series of neural connections that do not occur in other activities or with the simple act of listening to music or song. Whilst there is published evidence of music therapy in specific clinical populations, few have rigorously analysed the potential of community singing in quality of life community group singing which has a significant effect on quality of life related to mental health, anxiety and depression (Coulton, Clift, Skingley and Rodriguez, 2015). The activities that are offered by Music for Life (MfL) are supported by these theoretical framework.

Music for Life (MfL) is based on the hypothesis that singing in a choir can help prevent or delay neurodegenerative diseases. The project is based on active musical engagement, for adults and the elderly, for the prevention of dementia and as a generator of well-being. l'Alcalatén de l'Alcora in Spain, is an association of retirees and pensioners, participate in the MfL project, with various musical activities. The project includes: composition, improvisation, body percussion and involves performances and concerts.



The **MfL** project, which takes place in a small municipality, started from the idea of a choir of older people. This chorus that carried out its work passively, and according to them, increasingly unmotivated, became enthusiastic when they were asked to participate in a research project. The research is aimed at testing a new methodology linked to music training and education, using the body and voice as the main tools. The work

is based on the examples taken from activities on polyrhythms, the interpretation of songs with Orff (Orff and Keetman, 1969), musical instruments, emphasising the choral ensemble and the corporal expression and musical pedagogy of Dalcroze (2000). There is evidence of music related to the quality of life of the elderly, although the practice of active music increases these benefits, and therefore we rely on this type of use of music.



In addition, rhythmic activity allows the integration of oral awareness, with rhythm being the main element of music, which helps in the development of all aspects related to movement, coordination and the psychomotor scheme that allows greater awareness of the body.



It has not been possible to carry out all the measurements that were proposed at the beginning, however, the follow-up regarding the memory of the songs and the corporal expression, translated into movements of coordination and laterality, it can be said that all have improved, in different proportions, gradually increasing your improvement. Given the results obtained, we plan to influence more on psychomotor skills, without neglecting the rote work of the songs. We believe

that we have responded to the first two objectives that we set ourselves. We plan to programme new activities with greater connections, musical, psychomotor and open them also taking into account the neural processes. We will continue working in this line, but with modifications and adaptations both in the data collection process and in the implementation of activities.

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# Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

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## Keywords

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pharmacy; health spaces;  
health architecture;  
pharmacy environment

## Abstract

**Aim:** This systematic review aimed to provide new insights into how pharmacy spaces, or the *architecture of pharmacies*, are experienced by pharmacy service users and staff. The review sought to identify environmental factors which may influence service users' and staff participation in community-based pharmacy health services.

**Method:** Ten databases were searched for English language publications, using a combination of search terms relating to pharmacy service users and staff; pharmacy spaces; and health and social care outcomes. Data from the final selected studies were extracted, thematically analysed using a narrative approach and the quality of each study assessed using the Integrated quality Criteria for the Review of Multiple Study designs (ICROMS).

**Results:** 80 articles reporting 80 studies published between 1994 and 2020 were identified; they were from 28 countries, involving around 3234 community pharmacies, 13,615 pharmacy service users, 5056 pharmacists and 78 pharmacy health staff. Most studies (94%) met the ICROMS minimum score, and half did not meet the mandatory quality criteria. Four themes likely to influence service users' and staff experiences of pharmacy health services were identified: (1) privacy; (2) experience of the physical environment; (3) professional image; and (4) risk of error.

**Conclusion:** To optimise the delivery and experience of pharmacy health services, these spaces should be made more engaging. Future applied research could focus on optimising inclusive pharmacy design features.

## INTRODUCTION

Community pharmacy has been defined as a space where medicine-related services are provided to patients by pharmacists to promote health through person-centred care.<sup>1,2</sup> Community pharmacies are essential health spaces and contribute significantly to the public health globally. However, there is currently no universal accepted definition that encompasses the broad range of activities and services provided by community pharmacy.<sup>2</sup> Worldwide, community pharmacies are located where people live, work and shop. Survey conducted by the International Pharmaceutical Federation (FIP) between 2020 and 2021 reported there were around 1,609,734 community pharmacies in 76

countries and territories, serving around 75% of the world's population.<sup>3</sup> Community pharmacies in many countries vary in size and type, from large urban high-street chains to small independent stores in suburban communities and rural areas.<sup>3</sup>

With the growing demand for public healthcare and management of long-term conditions, community pharmacies play an important role in improving economic, social and clinical outcomes for individuals and their communities.<sup>4</sup> The World Health Organization supports health-promotion activities which drive the need for community pharmacy to be an accessible resource, that is open during the evenings and at weekends with no appointment required.<sup>5</sup> In addition, pharmacies provide a *social space* for communities, patients

## Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

and carers alike.<sup>6</sup> These interactions between visitors and staff often take on a social purpose where community-related conversations are discussed alongside health topics at the pharmacy counter, the consultation room and the shop floor.

Research highlights the value of developing patient–pharmacist relationship when providing health consultations.<sup>7</sup> During these encounters, pharmacy space is recognised as an emerging and vital factor to support patient and practitioner engagement,<sup>8–10</sup> emphasising the need to identify how best to optimise pharmacy spaces for people using and providing these services.

However, we do not know how these spaces are experienced by pharmacy patients and staff and the possible health and social implications of this. The design of healthcare environments, or *health architecture*, for promoting good health and wellbeing is growing into an important field of enquiry.<sup>11</sup> Salutogenic architecture, in other healthcare settings, predicted on the basis that space design can improve health outcomes for patients; for example, lighting, soundscape and seating area comfort can affect a user's experience of the physical space in such a way that it positively impacts their mental wellbeing.<sup>12</sup> In addition, noise has been found to increase employees' stress and fatigue levels which can lead to medical errors.<sup>13</sup> A well-designed interior layout can reduce staff fatigue and improve patient care, for example, by enabling nurses to provide rapid assistance when at-risk patients try to get out of bed.<sup>14</sup> The Joint Commission on Accreditation of Healthcare Organizations found that half of the falls cases were caused by factors in the physical environment.<sup>13</sup> Spaces which have not considered inclusive design can be disabling and inhibit engagement. For example, in primary healthcare settings, physical access to spaces can present barriers, especially for the disabled, and affect the quality of care and reduce their willingness to participate in treatment.<sup>15</sup> The design of hospitals and cancer care centres has been part of inclusive health architecture practice for the last two decades.<sup>16,17</sup> While evidence linking the design of

hospital and primary care settings to the quality and outcomes of care is increasing, there is limited research on community pharmacy spaces.

Research informed by health architecture theory highlights the importance of considering both patient and employee experience of health space.<sup>18</sup> Systematic reviews relating to pharmacy public health services have identified a range of perspectives and experiences; however, these have not focused on the effects of pharmacy spaces.<sup>19,20</sup> A systematic review of the existing evidence is needed to examine how community pharmacy spaces are experienced and to stimulate new understanding to effectively develop community pharmacy public health services globally. The objectives of this review were to (1) identify and appraise the designs of relevant empirical studies; (2) identify and assess the environmental factors which may influence patients' and staff participation in pharmacy health services; and (3) explore the possible health and/or social or professional implications of these.

### METHODS

The review protocol was prospectively published in PROSPERO (International Prospective Register of Systematic Review).<sup>21</sup> The review process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guideline.<sup>22</sup>

### Data sources and search strategy

The following 10 databases were searched for studies from their inception until 31 March 2020:

1. PubMed
2. PsycINFO (via Ovid)
3. Web of Science
4. Scopus
5. ScienceDirect
6. Journal Storage (JSTOR)
7. International Bibliography of the Social Sciences (IBSS)
8. Cochrane Central Register of Controlled Trials (CENTRAL)
9. Health Technology Assessment Database (HTA)
10. Social Care Online (SCIE)

### Search terms

Search terms were developed by applying the PICOC (Population, Phenomenon of Interest, Comparison, Outcome, Context) framework (Table 1).<sup>23</sup> The final search strategy was informed by combining terms relating to Population (P) of pharmacy service users and pharmacy health team (including pharmacist, pharmacy technician and medicine counter assistant);<sup>24</sup> Phenomena of Interest (I) covering any physical and social elements of the pharmacy space (including pharmacy layout, pharmacy counter, dispensary, consultation room and pharmacy retail area, lighting, noise and privacy); Comparison (C) included any health interventions reported; Outcome (O): were of reported experiences of the physical and social aspects of the pharmacy space, including satisfaction, engagement, attitudes, performance or health intervention outcomes; and Context (C): comprising studies conducted within any community pharmacy settings, from any country and location (e.g. chain and independent establishments). Studies based in hospital pharmacies, clinics or online were excluded. The relevant synonyms and Medical Subject Headings (MeSH) were incorporated into the final search strategy which was adjusted for each database. Reference list of the included studies and relevant systematic reviews were checked. An exemplar search strategy as used for PubMed database is presented in Supplemental Material 1.

### Inclusion/exclusion criteria

All primary studies, of any study design published in English, relating to pharmacy users and staff experience of the community pharmacy space were selected (Table 2). We excluded nonempirical study data, that is, from textbooks, grey literature, reviews and meta-analyses.

### Study selection

All search results were inputted into an Endnote library. After removing duplicates, all titles and abstracts were screened by S.S. against the inclusion and exclusion criteria. A second reviewer



Table 1

**Key search terms used for the systematic review based on PICOC (Population, Phenomenon of Interest, Comparison, Outcome, Context)**

<b>Population (P): pharmacy user or pharmacy staff</b>	<b>Phenomena of Interest (I): pharmacy space</b>	<b>Comparison (C)</b>	<b>Outcome (O): pharmacy outcomes</b>	<b>Context (C): pharmacy setting</b>
Pharmacy user User <sup>a</sup> Service user <sup>a</sup> Customer <sup>a</sup> Patient <sup>a</sup> Client <sup>a</sup> Pharmacy staff Pharmacist <sup>a</sup> Chemist <sup>a</sup> Counter staff <sup>a</sup> Technician <sup>a</sup>	Pharmacy design Interior design Evidence-based design Physical environment <sup>a</sup> Social environment <sup>a</sup> Architecture <sup>a</sup> Workspace <sup>a</sup> Space Lighting <sup>a</sup> Noise <sup>a</sup> Privacy Workstation People flow <sup>a</sup> Safety environment <sup>a</sup> Security <sup>a</sup> Comfort <sup>a</sup> environment <sup>a</sup> Centre of built environment	Any comparator or without comparison	Perception <sup>a</sup> Experience <sup>a</sup> Satisfact <sup>a</sup> Participat <sup>a</sup> Observation <sup>a</sup> Impression <sup>a</sup> Emotional effect <sup>a</sup> Environment effect <sup>a</sup> Engagement <sup>a</sup> Involve <sup>a</sup> Attitude <sup>a</sup> Work efficiency Performance <sup>a</sup> Workflow Work productivity Teamwork	Community pharmac <sup>a</sup> Pharmac <sup>a</sup> Chemist <sup>a</sup>

<sup>a</sup>Truncation utilises root words to find variations of terms.

(R.D.) independently screened a 5% random sample of all items. This screening process was repeated for full text of all potentially eligible papers. In addition, R.D. independently reviewed a 20% random sample of the excluded full-text papers, to address the possibility of missing potentially relevant studies. Any disagreements were resolved through discussions between R.D., J.S. and S.S.

### Quality assessment

The Integrated quality Criteria for the Review of Multiple Study designs (ICROMS) tool<sup>25</sup> was chosen to appraise the quality of the included quantitative, qualitative and mixed methods studies. The first step was to classify the study design for each study to select the appropriate criteria. The next step was to evaluate scores for each study, based on the specific criteria of each of the seven dimensions, as follows: (1) clear aim and justification; (2) managing bias in sampling or between groups; (3) managing bias in outcome measurement and blinding; (4) managing bias in follow-up; (5) managing bias in other study aspects; (6) analytical rigour; and (7) managing bias in reporting/ethical considerations.

Under each dimension, the specific criteria were rated on a three-point scale (2 = meets criterion, 1 = unclear and 0 = does not meet criterion). Each study was evaluated using a decision matrix comprising two components: mandatory criteria, which refers to quality criteria which must be met; and minimum score. For this review, studies of all quality criteria were included. ICROMS has no specific criteria for surveys and mixed method study designs; we therefore used the ICROMS qualitative studies criteria to rate these across the seven key dimensions.<sup>26</sup> R.D. independently assessed the quality of a 10% random sample of the included studies. Any differences were discussed with R.D., J.S. and S.S. until a consensus was agreed.

### Data extraction and synthesis

We devised a data extraction table<sup>27</sup> to ensure all relevant information was included to address the review questions. The data extraction table included headings relating to study characteristics; pharmacy service user characteristics (age groups and presenting health conditions); pharmacy

staff (professional role); pharmacy type; study design; outcome measures used; and results. As the systematic review involved the analysis of data from different study designs, thematic synthesis was first used to identify the main, recurring and/or significant issues through all quantitative and qualitative data.<sup>28</sup> This was followed by a narrative approach<sup>29</sup> focusing on the key aspects of pharmacy users' and staff experiences.

## RESULTS

The search initially retrieved 4517 records. After screening titles and abstracts, against the inclusion criteria, 159 full-text papers were read (Figure 1, PRISMA flow diagram). From these, 80 papers reporting 80 research studies published in English between 1994 and 2020 were included.

### Overview of included studies

Most of the studies ( $n=60$ ) were published during 2010–2020 (Table 3). Study designs used included surveys ( $n=40$ ); individual interviews ( $n=19$ ); qualitative focus groups ( $n=8$ ); mixed method study ( $n=11$ ); nonrandomised

Table 2

<b>PICOC (Population, Phenomenon of Interest, Comparison, Outcome, Context): inclusion and exclusion criteria</b>		
<b>Category</b>	<b>Inclusion criteria</b>	<b>Exclusion criteria</b>
Population (P)	<ul style="list-style-type: none"> <li>– Pharmacy users of any characteristics.</li> <li>– All members of the pharmacy health team: pharmacists, dispensing staff, accredited checking technicians and counter staff.</li> </ul>	Any other population
Phenomena of Interest (I)	<p>Any environmental factors experienced by pharmacy users and staff of the community pharmacy space.</p> <p>Examples of environmental factors: lighting; noise; and privacy.</p> <p>Examples of pharmacy spaces: health counter; dispensary area; consultation room; and retail area.</p>	Not related to the community pharmacy spaces
Comparison (C)	Any comparison, with or without controls.	Not applicable
Outcome (O)	Any outcomes relating to pharmacy users' and staff experiences of the community pharmacy space when accessing or delivering pharmacy health services. Outcomes include the level of privacy, adequate space and professionalism.	Not applicable
Context (C)	<p>Community pharmacy can be part of a</p> <ul style="list-style-type: none"> <li>– Supermarket</li> <li>– Chain store</li> <li>– Independent store</li> </ul>	<ul style="list-style-type: none"> <li>– Hospital pharmacy</li> <li>– Other clinic settings</li> <li>– Online</li> </ul>

study with a control group ('controlled before-after') ( $n=1$ ); and cohort study ( $n=1$ ). The 40 survey studies involved questionnaires which were administered to participants to understand their perceptions, emotions and views on a range of pharmacy health services. The mixed method studies comprised six survey/qualitative studies; two qualitative/biophotographic studies; one observational/qualitative study; one observational/survey study; and one qualitative/Delphi technique study. The nonrandomised study with a control group observed participants before and after an intervention to compare views on different pharmacy environments. The cohort study ( $n=1$ ) examined pharmacists' perspectives of organisational culture in the pharmacy environment.<sup>30</sup>

The 80 studies were conducted in 28 countries across six continents and region (Africa, Asia, Australasia, Europe, Middle East and North America). Of the approximate total 3234 pharmacies, 672 were reported to be in urban ( $n=593$ ); suburban ( $n=11$ ); and rural areas ( $n=168$ ). The definitions of 'urban' (city), 'suburban' and 'rural' areas were based

on population densities of approximately 3000+, between 1000 and 3000 and 1000 people per square mile, respectively.<sup>31</sup> Altogether around 13,615 pharmacy service users were included as participants. Not all studies reported demographic characteristics of participants, such as age and gender. Study participants also included around 5056 pharmacists and 78 pharmacy staff (including medicine counter assistants, dispensing assistants and accuracy-checking technicians).

There were universal concerns about privacy and lack of space across the different continents. Studies focused on similar health and pharmacy practice issues irrespective of country. However, nearly all studies from the global South regions (Africa, Asia and the Middle East) were quantitative surveys, that is, questionnaire or interviews, except one qualitative semi-structured interview study from Malaysia.<sup>32</sup>

### Overall quality of studies

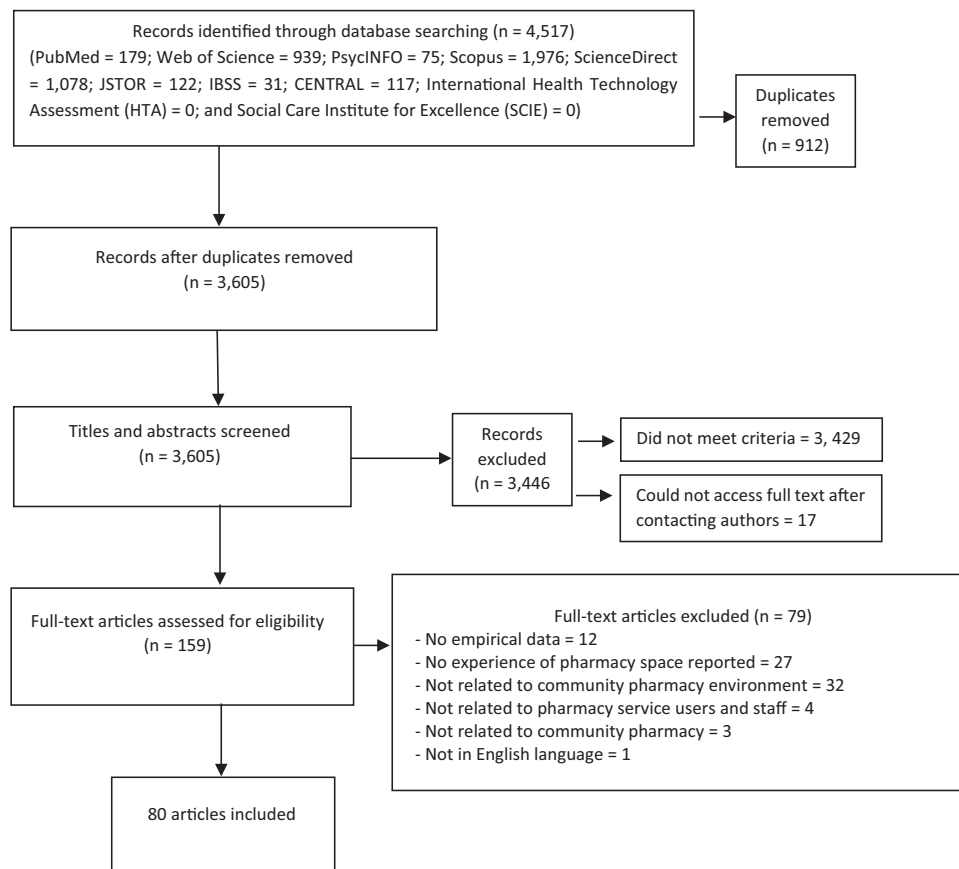
A quality assessment and comparison of the global ICROMS minimum score requirements for each included study is

presented in Supplemental Material 2.<sup>25</sup> Of all 80 studies, 75 met the ICROMS minimum score requirement, 36 did not meet one mandatory criteria and 4 did not meet two mandatory criteria. This suggests that half of the studies were of low quality. For the 27 qualitative studies identified, ICROMS global quality scores ranged from 14 to 23 (mean=20, ICROMS minimum score requirement=16). Another nine qualitative studies did not pass the mandatory criteria for the sampling dimension (2F), although their overall score met the minimum score requirement.

For the 40 survey studies identified, the ICROMS minimum scores ranged from 13 to 22 (mean=18.6, ICROMS minimum score requirement (based on the criteria for qualitative studies)=16). From this group, three studies<sup>33-35</sup> did not pass the minimum score requirement. The ICROMS global scores for the 11 mixed methods studies ranged from 17 to 21 (mean=19.6, ICROMS minimum score requirement (based on the criteria for qualitative studies)=16), and all met the minimum score requirement. The one controlled before-

Figure 1

## PRISMA flow diagram of the literature search and selection process



after study<sup>36</sup> had a quality score of 23, passing the minimum ICROMS score requirement of 18. However, it did not pass the mandatory criteria for the sampling dimension (2D). The one cohort study<sup>30</sup> had a quality score of 17 which missed the ICROMS minimum requirement of 18. The main issue encountered for most studies was due to managing bias in sampling or between groups, and establishing clear aims and justification, that is, providing a definitive explanation of the study design and specifying the rationale for the choice of research method.

### Data synthesis of included studies

A summary of our included studies is presented in Table 4. The study findings were synthesised to identify themes, informed by the review's objectives, on how the physical and social aspects of the community pharmacies may

influence engagement and satisfaction with pharmacy health services and possible health and/or social or professional implications of these. Most studies explored the theme relating to 'privacy', followed by 'experience of the physical environment', while fewer explored 'professional image' and 'risk of error'. Some studies included more than one theme and some themes overlapped, particularly aspects relating to privacy and experience of the physical environment.

### Privacy

Privacy was a major theme reported in 51 studies, which demonstrate the significance of this issue. Participants were most dissatisfied with lack of privacy,<sup>39,56,78,81,98,104,105,107</sup> and small pharmacy spaces.<sup>46,47,51</sup> In some regions, pharmacies did not have a separate consultation area.<sup>45,61,63</sup> Having

a private consultation room or a dedicated private area was considered important,<sup>33,60,98</sup> as this allowed participants to have confidential conversations with the pharmacist.<sup>50</sup>

Privacy was of concern during patient medication reviews which took place in pharmacies without a consultation room, such as in Norway<sup>86</sup> and Lebanon.<sup>74</sup> Lack of privacy was thought to affect participants' behaviour, including reduced understanding about treatment during over-the-counter medication counselling.<sup>56</sup> Privacy was a factor for participants when choosing a particular pharmacy for opioid substitution therapy,<sup>44</sup> favouring those which could offer a private room.<sup>111</sup> For sexual health, teenagers reported feeling embarrassed to discuss birth control medication in the pharmacy.<sup>61</sup> In addition, participants were concerned about the lack of a comfortable space to have intimate

Table 3

**Summary characteristics of 80 included studies (N= number of studies or another variable as described)**

<b>Study characteristic</b>	<b>Study characteristic details</b>	<b>N</b>
Study design	Survey	40
	Qualitative study	27
	Mixed methods	11
	Controlled before-after	1
	Cohort	1
Year of publication	1990–1999	2
	2000–2009	18
	2010–2019	56
	2020	4
Study continent or region	Africa	4
	Asia	6
	Australasia	16
	Europe	32
	Middle East	12
	North America	10
Pharmacy geographical areas and pharmacy type	Total community pharmacies	3234
	Area <sup>a</sup> - Urban	593
	- Suburban	11
	- Rural	168
	Type <sup>a</sup> - Independent	465
	- Chain	753
Participants' characteristics <sup>a</sup>	Pharmacists	5056
	Pharmacy support staff	78
	Pharmacy service users	13,615
	Study population of focus:	
	Elderly people (aged ≥65 years)	1 Study
	Young people (aged 12–25 years)	3 Studies
	Men's health	1 Study
Women's health	1 Study	

*(Continued)*

Table 3 (Continued)

Summary characteristics of 80 included studies (N = number of studies or another variable as described)		
Study characteristic	Study characteristic details	N
Number of studies reporting specific health conditions or services <sup>a</sup>	Contraception	2
	Drug and alcohol problems	6
	Gastrointestinal conditions	1
	Heart disease	3
	Intimate partner violence (IPV)	1
	Mental health	8
	Public health roles	2
	Respiratory disease	2
	Sexual health	3
	Skin conditions	1
	Smoking cessation	1
	Weight management	1

<sup>a</sup>Not all studies provided details of participants or sample size.

partner violence screening consultations,<sup>70</sup> and homosexual men reported the lack of a safe place for sexual health screening.<sup>41</sup>

Pharmacists reported a lack of privacy when consulting with patients about their mental health.<sup>77,84,102</sup> Young mental health patients described a lack of privacy due to pharmacies' open plan spaces<sup>49</sup> which was exacerbated during busy periods.<sup>37</sup> Studies from England and New Zealand showed many pharmacy users were unaware of the presence of a private consultation area,<sup>54,55</sup> especially young people<sup>103</sup> and because sometimes pharmacists did not offer the consultation room to their patients.<sup>58,62,71,79</sup> Privacy problems were also reported when consulting about skin disease,<sup>59</sup> weight management<sup>45</sup> and influenza vaccinations.<sup>69</sup>

Alternative views were also expressed. For example, in the United Arab Emirates (UAE), more than a third of participants reported that their privacy had been

respected despite the lack of a private consultation room.<sup>75</sup> Overall, there was an insufficient level of privacy within pharmacy services.<sup>57</sup> Participants expressed increased privacy could be achieved by reducing noise, moving to a quieter area of the store or avoiding conversations in front of other people.<sup>51</sup> The dominance of privacy as an issue in pharmacy health service is an important one affecting an individual's decision to use community pharmacy as the first point of contact.<sup>90</sup>

#### *Experience of the physical environment*

This broad theme relates to participants' experiences arising through engaging with the physical environment of pharmacy spaces, which was reported in 39 studies. The physical environment encompasses a range of attributes including space layout, comfort, ease of orientation around the pharmacy, display of merchandise and level of tidiness. These factors are thought to affect

pharmacy users' satisfaction, trust in community pharmacists and loyalty towards the pharmacy.<sup>73</sup> Convenience and cleanliness of the pharmacy space was found to influence users' satisfaction.<sup>87</sup> In contrast, the factor which least affected Jordanian patients' choice of pharmacy was its physical environment.<sup>76</sup> This may have been due to the short duration of time spent by patients in pharmacies; thus, the physical space was not considered as important as other issues.

Findings from Rapport *et al.*<sup>108,109</sup> showed the dispensary to be a space people can look into, giving employees a sense of being monitored and making them susceptible to interruption which overlaps with the theme 'risk of error'. Some findings suggested consultation rooms should be close to the pickup window, where patients receive their prescription, the space should have computer access, comfortable seating, a whiteboard and easy access for disabled

## Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

Table 4

Summary of included studies				
Study and author(s)	Country	Study design	Characteristics of participants, pharmacy site and any specified health conditions or services (sample size) <sup>a</sup>	Physical and social aspects of community pharmacy space investigated <sup>b</sup>
<i>Cohort study</i>				
Marques et al. <sup>30</sup>	The UK	Mixed methods	Pharmacists (209)	Perspectives on organisational culture in the pharmacy environment
<i>Controlled before-after study</i>				
Mobach <sup>36</sup>	The Netherlands	Experimental study	Patients (800) and community pharmacies (2)	Visual and acoustic privacy, being observed and overhearing conversations
<i>Qualitative studies</i>				
Allan et al. <sup>37</sup>	Scotland	In-depth interviews	Smokers (14)	Privacy within the pharmacy environment
Aradottir and Kinnear <sup>38</sup>	Scotland	Focus group	Pharmacists (4) and gastrointestinal conditions (dyspepsia)	Privacy within the pharmacy environment
Cassie et al. <sup>39</sup>	Scotland	Semi-structured interviews	Pharmacists (19) and medicine counter assistants (11)	Privacy within the pharmacy environment
Chui et al. <sup>40</sup>	The US	Semi-structured interviews	Pharmacists (8) and community pharmacies (6)	Consultation area
Crawford et al. <sup>41</sup>	The US	Semi-structured interviews	Pharmacists (6) and homosexual men (8)	Privacy within the pharmacy environment
DaCosta et al. <sup>42</sup>	England	Semi-structured interviews	Pharmacists (16) and stroke survivor patients (15)	Consultation area
Donovan and Paudyal <sup>43</sup>	England	Semi-structured face-to-face interviews	Pharmacy support staff (21) and community pharmacies (21) (independent pharmacies (9) and chains (12))	Consultation area
Gidman and Coomber <sup>44</sup>	Scotland	Focus groups	Pharmacy service users (26) and opioid substitution therapy services	Perspectives on open plan pharmacy spaces and privacy
Gray et al. <sup>45</sup>	New Zealand	Semi-structured face-to-face interview	Pharmacists (11); community pharmacies (11); and weight management service	Consultation area
Hattingh et al. <sup>46</sup>	Australia	In-depth interviews	Pharmacy service users and carers (74) and mental health conditions (depression, anxiety, bipolar affective disorder and schizophrenia and other psychotic disorder)	Privacy within the pharmacy environment
Hattingh et al. <sup>47</sup>	Australia	Open-ended face-to-face interviews	Pharmacists (25); pharmacy service users (55); and community pharmacies (25) (independent pharmacies (13) and chains (12))	Privacy within the pharmacy environment
Kho et al. <sup>32</sup>	Malaysia	Semi-structured interviews	Pharmacists (20); community pharmacies (20) (independent (14) and chains (6)); and location: city (15) and rural (5)	Lack of space in pharmacy
Lawrie et al. <sup>48</sup>	Scotland	Semi-structured interviews	Community pharmacies (10); pharmacy service users (80); and drug misuse services	Privacy within the pharmacy environment

(Continued)

## Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

Table 4 (Continued)

<b>Summary of included studies</b>				
<b>Study and author(s)</b>	<b>Country</b>	<b>Study design</b>	<b>Characteristics of participants, pharmacy site and any specified health conditions or services (sample size)<sup>a</sup></b>	<b>Physical and social aspects of community pharmacy space investigated<sup>b</sup></b>
McMillan et al. <sup>49</sup>	Australia	Semi-structured interviews	Pharmacists (11); younger pharmacy service users (aged 14–25 years); and mental health conditions (18)	Privacy within the pharmacy environment
Mobach <sup>50</sup>	The Netherlands	Interviews	Pharmacists (8) and community pharmacies (8)	Consultation area
Norris and Rowsell <sup>51</sup>	New Zealand	Qualitative analysis of written accounts	Pharmacy service users (12) and community pharmacies (180)	Privacy within the pharmacy environment
Le and Braunack-Mayer <sup>52</sup>	Australia	Semi-structured face-to-face interviews	Community pharmacies (1) and opioid substitution treatment patients (14)	Privacy within the pharmacy environment
Pumtong et al. <sup>53</sup>	England	Semi-structured face-to-face interviews	Pharmacists (26); community pharmacies (25) (independent pharmacies (14) and chains (11))	Privacy within the pharmacy environment
Rapport et al. <sup>54</sup>	England	Consultation workshops using biophotographic data	Pharmacists (24); pharmacy support staff (4); and pharmacy service users (6)	Privacy and professional image within the pharmacy environment
Saramunee et al. <sup>55</sup>	England	Focus groups	Pharmacists (9) and pharmacy-based public health services	Consultation area
Seubert et al. <sup>56</sup>	Australia	Focus groups	Pharmacists (28); pharmacy assistants (5); and pharmacy service users (27)	Privacy within the pharmacy environment
Steckowych et al. <sup>57</sup>	The US	Focus groups	Pharmacy service users (18) and community pharmacies (18) (independent pharmacies (1) and chains (17))	Privacy within the pharmacy environment
Thompson and Bidwell <sup>58</sup>	New Zealand	Focus groups	Pharmacists (20) and pharmacy service users (27)	Professional image
Tucker and Stewart <sup>59</sup>	England	Semi-structured telephone interviews	Community pharmacies (7); patients (25); location: city (2), suburbs (3) and rural (2); and skin conditions	Privacy within the pharmacy environment
Watson et al. <sup>60</sup>	The UK	Focus groups and interviews	Pharmacy service users (20)	Privacy within the pharmacy environment
Wilkinson et al. <sup>61</sup>	The US	Semi-structured telephone interviews	Older teens (aged 18–19) (30) and birth control services	Privacy within the pharmacy environment
Wood et al. <sup>62</sup>	Australia	Semi-structured interviews	Pharmacists (12) and sexual health services	Consultation area
<i>Survey studies</i>				
Akram et al. <sup>63</sup>	Malaysia	Self-administered questionnaire	Pharmacists (150); community pharmacies (150) (independent (26) and chains (124)); location in cities (150); and asthma management services	Consultation area
Al-Arif <sup>64</sup>	Saudi Arabia	Self-administrative questionnaire	Pharmacists (43); community pharmacies (9); and mental health services (schizophrenia, depression, mania, paranoia, panic, obsessive compulsive disorder (OCD) and anxiety)	Consultation area
Saad Ali et al. <sup>65</sup>	The United Arab Emirates	Self-administered questionnaire	Patients (210)	Privacy within the pharmacy environment

(Continued)

## Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

Table 4 (Continued)

Summary of included studies				
Study and author(s)	Country	Study design	Characteristics of participants, pharmacy site and any specified health conditions or services (sample size) <sup>a</sup>	Physical and social aspects of community pharmacy space investigated <sup>b</sup>
Al Laif et al. <sup>66</sup>	Saudi Arabia	Questionnaire	Community pharmacists (58)	Privacy within the pharmacy environment
Allison et al. <sup>67</sup>	England	Questionnaire	Community pharmacies (77) and heart disease screening	Privacy and lack of space within the pharmacy environment
Alsaleh et al. <sup>68</sup>	Kuwait	Self-administered questionnaire	Pharmacists (253)	Safety culture within the pharmacy environment
Alotaibi and Abdelkarim <sup>33</sup>	Saudi Arabia	Structured face-to-face questionnaire	Pharmacy service users (100)	Privacy within the pharmacy environment
Alsabbagh et al. <sup>69</sup>	Canada	Questionnaire	Community pharmacies (6); pharmacy service users (541); and influenza vaccinations	Privacy within the pharmacy environment
Barnard et al. <sup>70</sup>	The US	Questionnaire	Female pharmacy service users (60) and intimate partner violence (IPV)	Lack of comfortable space in the pharmacy
Bawazir <sup>71</sup>	Saudi Arabia	Self-administered questionnaire	Pharmacy service users (911) and community pharmacies (55)	Privacy within the pharmacy environment
Cagirci et al. <sup>72</sup>	Turkey	Face-to-face interviews	Pharmacists (200) and community pharmacies (200)	Physical appearance of the pharmacy
Castaldo et al. <sup>73</sup>	Italy	Telephone interviews	Pharmacy service users (735)	Physical appearance and layout of the pharmacy
Domiaty et al. <sup>74</sup>	Lebanon	Self-administered questionnaire	Pharmacists (820)	Consultation area
Ei-Sharif et al. <sup>75</sup>	The United Arab Emirates	Questionnaire	Patients (375)	Privacy within the pharmacy environment (consultation area)
Ghattas and Al-Abdallah <sup>76</sup>	Jordan	Self-administered questionnaire	Pharmacy service users (801)	Physical pharmacy environment not considered important
Hall et al. <sup>77</sup>	Australia	Semi-structured questionnaires	Pharmacy service users (537) and mental health conditions (depression, anxiety, post-traumatic stress disorder (PTSD), bipolar disorder, OCD, panic attacks and schizophrenia)	Privacy within the pharmacy environment
Iskandar et al. <sup>78</sup>	Lebanon	Questionnaire	Patients (565) and community pharmacies (42)	Privacy within the pharmacy environment
Khdour and Hallak <sup>79</sup>	Palestine	Questionnaire	Pharmacy service users (790) and community pharmacies (39)	Privacy within the pharmacy environment
Knowles et al. <sup>80</sup>	England	Questionnaire	Pharmacists (263) and community pharmacies (263)	Consultation area
Krska and Morecroft <sup>81</sup>	England	Questionnaire	Healthy adult pharmacy service users (300) and public health role of community pharmacies	Privacy within the pharmacy environment
Laird et al. <sup>82</sup>	Scotland	Semi-structured questionnaires	Pharmacists (508); community pharmacies (111) (independent (43) and chain or health centre (67)); location (cites (108) and suburbs (2)); and drug misuse services	Privacy within the pharmacy environment

(Continued)



## Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

Table 4 (Continued)

Summary of included studies				
Study and author(s)	Country	Study design	Characteristics of participants, pharmacy site and any specified health conditions or services (sample size) <sup>a</sup>	Physical and social aspects of community pharmacy space investigated <sup>b</sup>
Lea et al. <sup>83</sup>	Australia	Self-administered questionnaire	Pharmacy service users (508); community pharmacies (50); and opioid treatment services	Privacy within the pharmacy environment
Liekens et al. <sup>84</sup>	Belgium	Questionnaire	Pharmacists (149) and mental health (depression)	Privacy within the pharmacy environment
Malewski et al. <sup>85</sup>	The US	Self-administered questionnaire	Patients (326)	Privacy within the pharmacy environment
Mamen et al. <sup>86</sup>	Norway	Questionnaire	Older pharmacy service users (162), (age $\geq 65$ years)	Privacy within the pharmacy environment
Mehralian et al. <sup>87</sup>	Iran	Self-administered questionnaire	Pharmacy service users (797) and community pharmacies (200)	Physical pharmacy environment not considered important
Mohamed et al. <sup>88</sup>	Sudan	Self-administered questionnaire	Pharmacists (183)	Lack of space in the pharmacy
Offu et al. <sup>89</sup>	Nigeria	Questionnaire	Pharmacists (40); community pharmacies (40); public health role of community pharmacies	Lack of space in the pharmacy
Okai et al. <sup>90</sup>	Ghana	Questionnaire	Pharmacy service users (497)	Privacy within the pharmacy environment
Okonta et al. <sup>91</sup>	Nigeria	Semi-administered questionnaire	Pharmacists (19)	Consultation area
Pronk et al. <sup>34</sup>	The Netherlands	Questionnaire	Pharmacists (118)	Lack of space in the pharmacy
Puspitasari et al. <sup>92</sup>	Australia	Self-administered questionnaire	Pharmacists (209); community pharmacies (209); and cardiovascular disease services	Perspectives on organisational culture in the pharmacy environment
Szeinbach et al. <sup>93</sup>	The US	Questionnaire	Pharmacists (398) and community pharmacies (398) (independent (94) and chain (304))	Risks of error
Teinila et al. <sup>94</sup>	Finland	Open-ended question and Likert-type statements	Pharmacists (340) and community pharmacies (340)	Risks of error
Son et al. <sup>95</sup>	South Korea	Self-completed web-based questionnaire	Members of the public (current or future pharmacy service users) (1000)	Consultation area
Ung et al. <sup>96</sup>	Macao	Questionnaire	Pharmacists (100) and community pharmacies (100) (independent (30) and chain (70))	Consultation area
Villako and Raal <sup>35</sup>	Estonia	Questionnaire	Pharmacists (135); pharmacy service users (1979); community pharmacies (7); location: cities (3), suburbs (2) and rural (2)	Privacy and comfort
Whelan et al. <sup>97</sup>	Canada	Self-administered questionnaire	Pharmacists (451) and contraceptive services	Privacy within the pharmacy environment
Wirth et al. <sup>98</sup>	Malta	Self-administered questionnaire	Pharmacy service users (500) and community pharmacies (50)	Privacy within the pharmacy environment
Xi et al. <sup>99</sup>	China	Questionnaire	Pharmacists (163) and community pharmacies (163) (independent pharmacies (74) and chains (89))	Lack of privacy and space

(Continued)

## Systematic review on the effects of the physical and social aspects of community pharmacy spaces on service users and staff

Table 4 (Continued)

Summary of included studies				
Study and author(s)	Country	Study design	Characteristics of participants, pharmacy site and any specified health conditions or services (sample size) <sup>a</sup>	Physical and social aspects of community pharmacy space investigated <sup>b</sup>
<i>Mixed methods studies</i>				
Angelo et al. <sup>100</sup>	The US	Survey and observation	Pharmacists (11); patients (173); and chain community pharmacies (4)	Privacy within the pharmacy environment
Deeks et al. <sup>101</sup>	Australia	Questionnaire and focus groups	Pharmacy assistants (36); community pharmacies (6); location: cities (4) and suburbs (2); and sexual health services	Privacy within the pharmacy environment
Hattingh et al. <sup>102</sup>	Australia	Surveys and semi-structured interviews	Pharmacists (142); pharmacy support staff (21); community pharmacies (100); and mental health services (depression and anxiety)	Privacy within the pharmacy environment
Horsfield et al. <sup>103</sup>	New Zealand	Survey and qualitative consultation	Pharmacists (251); young people (aged 12–25 years) (8); community pharmacies (251) (independent (129) and chains (117)); and location: cities (191) and rural (54)	Privacy within the pharmacy environment
Horvat and Kos <sup>104</sup>	Slovenia	Semi-structured interviews and Delphi technique	Patients (43)	Privacy and working environment within the pharmacy
Munro et al. <sup>105</sup>	England	Survey and face-to-face interviews	Not possible to determine sample size of participants who reported about the pharmacy environment	Privacy within the pharmacy environment
O'Reilly et al. <sup>106</sup>	Australia	Semi-structured interviews	Pharmacists (20); community pharmacies (12) (independent (8) and chain (4); location: cities (9) and rural (3); and mental health (depression) screening services	Consultation area and professional image
Pumtong et al. <sup>107</sup>	England	Semi-structured interviews and survey	Not possible to determine sample size of participants who reported about the pharmacy environment	Privacy within the pharmacy environment
Rapport et al. <sup>108</sup>	Wales	Qualitative biophotographic study	Pharmacists (16); community pharmacies (16) (independent (5) and chains (11))	Perspectives on pharmacy spaces (dispensary, consultation room and sales area) and professional image
Rapport et al. <sup>109</sup>	Wales	Consultation workshops by bio-photographic data	Pharmacists (16); community pharmacies (16) (independent (5) and chains (11)) Same data as Rapport et al. <sup>108</sup>	Lack of privacy and space
Rogers et al. <sup>110</sup>	England	Observation and telephone interviews	Pharmacy service users (44); community pharmacies (10) (independent (5) and chains (5)); location: cities (6), suburbs (2) and rural (2); and perceptions of advice giving services	Consultation area

<sup>a</sup>For some studies, the sample size presented here relate only to part of the study which explored pharmacy spaces.

<sup>b</sup>Some physical and social aspects of the community pharmacy overlapped; all these are not detailed in the summary table, that is, when consultation areas were mentioned, participants also expressed concerns about privacy.

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people.<sup>40,60</sup> Pharmacists also preferred to consult in a quiet area, separate from the counter.<sup>80</sup> There was also accessibility problem for stroke survivors in wheelchairs and caregivers,<sup>42</sup> and it was recommended the consultation rooms should be larger to reduce discomfort.<sup>109</sup> Some viewed these spaces as undesirable if it was used by patients receiving treatment for drug problems.<sup>55,110</sup> In Scotland, patients in treatment for drug problems were reluctant to use these rooms as they feared being identified as a 'methadone client',<sup>44</sup> and perceived it to be an uncomfortable or embarrassing space.<sup>39</sup>

Findings relating to experience of the physical environment was also connected to the pharmacy waiting area. Unsurprisingly, given the typical size of a community pharmacy, the waiting area was described as being small.<sup>110</sup> Some respondents indicated that having a seat improved comfort, and information on the wall was useful while awaiting HIV screening results.<sup>41</sup> Likewise, a survey study showed that comfortable waiting areas in Tehran enhanced patients' satisfaction.<sup>87</sup> However, in an urban pharmacy sales area, glass partitions with shelves filled with items obstructed the pharmacist's view of patients in the waiting area.<sup>110</sup>

### Professional image

Four studies addressed this theme. The design of open spaces influenced pharmacists' sense of self-worth and professionalism, and the orderliness of the environment affected the way patients perceived pharmacy staff level of professionalism.<sup>109</sup> The same issue applied to the dispensary, where this space is shared with other staff for a prescription preparation or checking. A tidy dispensary made the space look more professional and less stressful.<sup>108,109</sup> Ideally, the pharmacy counter should be a safe space which reflects the professional identity of the pharmacist and the store.<sup>58</sup> It was found that spaces were not always used for their designated function. Consultation rooms were sometimes used as a temporary storage room, which detracted from the professional image.<sup>108</sup>

The relationship between a sales area and a pharmacy counter was interesting: large chain stores sometimes have no clear boundaries between these areas, requiring the pharmacist to act as a salesperson at the same time. This, too, may be perceived as unprofessional by pharmacy patients.<sup>54</sup>

### Risk of error

Only three studies addressed this theme. Pharmacists reported that poor design of the physical space (e.g. work area, storage and shelving) contributed to dispensing errors and difficulties with communicating with other staff.<sup>93</sup> Another survey found that the working environment (e.g. space, equipment and noise) causes dispensing errors which could be prevented by a well-designed workspace.<sup>94</sup> Pharmacists perceived an environment that is well organised and free of clutter, and whose physical layout supports good workflow would be conducive to achieve high patient safety standards.<sup>68</sup> Pharmacists in Finland reported that the most likely cause of dispensing errors was a lack of dispensary work space.<sup>94</sup> It is clear that structured planning in this area could help prevent dispensing errors.

## DISCUSSION

This is the first known comprehensive review to systematically examine published research on how community pharmacy spaces are experienced by pharmacy service users and staff. From searching 4517 publications, we identified 80 papers which described 80 studies, published between 1994 and 2020, from 28 countries across six continents and region. Studies used a range of designs, including surveys, interviews, focus groups and mixed methods approaches. There were a diverse range of health conditions included in the studies: drug and alcohol problems; mental health; sexual health; heart disease; gastrointestinal conditions; respiratory disease; skin conditions; and weight management. Such diversity highlights the variety of pharmacy health services offered across the globe and signifies community pharmacy to be vital space for public health. Although half of

the studies did not meet the ICROMS mandatory quality criteria, the majority met the minimum quality score (94%). The studies were largely explorative in nature, thus highlighting how research evidence on optimal pharmacy design is still lacking.

Half the studies were mixed methods or qualitative in design, and the exploratory nature of the study designs may have enabled participants to express ideas about pharmacy spaces more readily, especially during qualitative interviews, even if space was not the primary focus. The data synthesis enabled the establishment of four overall themes, 'privacy'; 'experience of the physical environment'; 'professional image'; and 'risk of error'. The review highlighted the importance of the pharmacy design. Factors influencing pharmacy users' level of comfort included size, structure and design of the pharmacy space. From the staff perspective, the pharmacy layout influenced their sense of professionalism. The lack of privacy and space were two main environmental factors that affected pharmacy users and staff engagement. In addition, there was some misunderstanding of the purpose of the consultation room, for example, it was assumed to be used solely for the provision of particular pharmaceutical services such as drug misuse treatments.

Reasons for the scarcity of research about the impact of pharmacy spaces on healthcare outcomes is an interesting question which warrants further investigation. One possible explanation could be the slow development of interdisciplinary pharmacy practice education and research.<sup>112</sup> It is relatively recently that psychosocial community pharmacy health service research has gained ground, particularly in the global North, with advancement of new professional roles for pharmacists including independent prescribing, medication optimisation and other public health services.<sup>5,8</sup> Research during this period examined pharmacists' communication skills and patient's health outcomes; however, very few focussed on sensory or the visual experience of space,<sup>54,58,108,109</sup> and there is a

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conspicuous lack of studies informed by the arts and health architecture theories. This may explain the lack of findings exploring sensory experience in the review studies. A lack of interdisciplinary thinking within pharmacy practice research may be one reason for the absence of review studies examining pharmacy spaces. In addition, pharmacy practice research may not yet have attracted diverse individuals from a range of disciplines to share knowledge and experience. Pharmacy education and profession have traditionally been viewed as a science,<sup>113</sup> whereas medical education, health and social care training have evolved to embed the humanities and the arts, with some promising outcomes for patients, practitioners and students.<sup>114,115</sup> It will be interesting to see if and how pharmacy practice could integrate interdisciplinary thinking, especially the arts and participatory co-design approaches;<sup>116,117</sup> particularly to effectively optimise pharmacy spaces to improve health and wellbeing. To understand the broader spectrum of wellness and illness, application of salutogenic architecture could yield valuable insights for pharmacy.<sup>12</sup> Such interdisciplinary enquiry could accelerate pharmacy research in new directions, and have important implications for public health, particularly to further realise the potential impact of pharmacy as a key point of contact for health globally.

### Strengths and limitations

This is the first comprehensive review to systematically examine the published research on how community pharmacy spaces are experienced by pharmacy

service users and staff. The findings reported are from a range of continents, which adds to its strength; however, it is not possible to generalise the findings across such diverse communities as these could be culture specific, that is, different meanings could be attached to 'pharmacy space'.

### Future directions

Future research could focus on pharmacy service users' and staff experiences of pharmacy spaces as its primary aim and examine the potential benefit of inclusive pharmacy design features which specifically address sensory experience of space. In addition, privacy; professional image; and reducing risk from practice errors could be explored to examine implications of these for different cultures and communities. A participatory co-design approach could helpfully identify optimal designs which could then be evaluated prospectively in terms of impact on health outcomes, and both service user and staff outcomes.

### ACKNOWLEDGEMENTS

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### AUTHOR CONTRIBUTIONS

R.D. helped in conception and design of the protocol, screening and assessment of studies, data extraction, quality assessment, analysis and interpretation of

data, supervision of the review, writing the original draft and reviewing the article. S.S. helped in search, screening and assessment of studies, data extraction, quality assessment, analysis and interpretation of data and reviewing the article. This review also formed part of S.S.'s MSc research project (University of Reading, UK). J.S. helped in protocol design, screening and assessment of studies, data extraction, quality assessment, supervision of the review, writing and reviewing the article. G.R. helped in protocol design, writing and reviewing the article. C.V. helped in protocol design and reviewing the article.

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### SUPPLEMENTAL MATERIAL

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## **Are culturally vibrant communities healthier? Relationships between performing arts activity and health outcomes in the 500 largest US cities**

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**KEYWORDS:** Public Health; Music; Dance; Theatre; Epidemiology



1 **Abstract**

2 **Aims:** Recent reviews have demonstrated broad links between performing arts participation (*e.g.*  
3 *music-making; dancing; acting*) and receptive engagement (*e.g. listening to music; attending a*  
4 *dance/theatre performance*) and improved health, including reduced disease and mortality risk.  
5 However, no investigations to date have interrogated the links between community-level  
6 performing arts activity (*i.e. participation + receptive engagement*) and health outcomes – *i.e. do*  
7 *the performing arts help create healthy communities?* This study aims to address this question by  
8 examining links between performing arts activity and health outcomes across 500 cities in the  
9 United States.

10 **Methods:** Secondary analysis of demographic, health outcome, performing arts activity  
11 (estimated by annual performing arts revenue), and preventive/unhealthy behaviour data for 500  
12 large cities in the United States – data extracted from the US Centers for Disease Control 500  
13 Cities Project, Dun & Bradstreet Hoovers Database, and US Census. Links between performing  
14 arts activity and 12 health/disease outcomes were evaluated using a series of hierarchical beta  
15 regression models which progressively controlled for demographic variables and  
16 preventive/unhealthy behaviour prevalence.

17 **Results:** The 500 analysed US cities comprise 33.4% of the total US population and 84,010  
18 performing arts businesses (total annual revenue \$27.84 billion). No significant associations  
19 were found between performing arts activity and nine of twelve health outcomes in fully adjusted  
20 models ( $p \geq .17$ ). Statistically significant relationships ( $p < .01$ ) between increased performing arts  
21 activity and increased prevalence of chronic kidney disease, coronary heart disease, and stroke  
22 were determined to be clinically equivocal.

23 **Conclusions:** This study contributes to a growing body of conflicting epidemiologic evidence  
24 regarding the impact of the performing arts on health/disease and mortality outcomes, evaluated  
25 using a range of disparate methodologies. A consensus, psychometrically rigorous approach is  
26 required to address this prevailing uncertainty in future epidemiologic studies examining effects  
27 of performing arts activities both within and across countries and communities.

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## 42 **Introduction**

43 Recent systematic and scoping reviews have demonstrated broad links between performing arts  
44 participation (*e.g. music-making; dancing; acting*) and receptive engagement (*e.g. listening to*  
45 *music; attending a dance or theatre performance*) and improved health and wellbeing (1, 2).  
46 Included amongst these broad health benefits are suggestive links between the performing arts  
47 and a reduced risk of early mortality and non-communicable diseases including cancer, dementia  
48 and cardiovascular disease (3-7). However, no investigations to date have interrogated the links  
49 between community-level performing arts activity (*i.e. participation + receptive engagement*)  
50 and health outcomes – in other words, *do the performing arts help create healthy communities?*  
51 In addition to being directly health-promoting activities, the performing arts are also substantial  
52 contributors to culture in communities in the United States, with culture also independently noted  
53 to substantially impact health (8). The performing arts (*i.e. music, dance, theatre*) are the most  
54 popular artistic modalities in the United States - 43% of adults attend performing arts events at  
55 least once annually; 74% engage with the performing arts using electronic media (*e.g. television;*  
56 *online*); and 40% participate in the performing arts (*i.e. play an instrument, sing, dance, act*) at  
57 least once every year (9). This study aims to provide insights into the impact of the performing  
58 arts on community health by examining links between performing arts activity and health  
59 outcomes across 500 cities in the United States.

60

## 61 **Methods**

62 Study aims were addressed through secondary analyses of data obtained from the US Centers for  
63 Disease Control and Prevention 500 Cities Project (10), Dun & Bradstreet Hoovers Database  
64 (11), and the US Census Bureau (12).

65 *US Centers for Disease Control and Prevention 500 Cities Project (10) – Health Outcomes;*  
66 *Unhealthy & Preventive Behaviours*

67 The 500 Cities Project uses small area estimation methods (13) to approximate the prevalence of  
68 13 health outcomes, 9 preventive behaviours, and 5 unhealthy behaviours in the 497 largest US  
69 cities (as per 2010 US census). Additionally, to ensure representation from each US state, data  
70 from the largest cities in Vermont, West Virginia and Wyoming are included. The 2019 release  
71 of 500 Cities Project data was used in the present study.

72 Included health outcomes are: *arthritis; asthma; cancer; chronic kidney disease; chronic*  
73 *obstructive pulmonary disease (COPD); coronary heart disease; diabetes; high blood pressure;*  
74 *high cholesterol; poor mental health; poor physical health; tooth loss (all teeth); and stroke.*

75 Included unhealthy behaviours are: *binge drinking; smoking, physical activity; obesity; and*  
76 *insufficient sleep.* Included preventive behaviours are (restricted to appropriate age groups as  
77 relevant): *annual dental visit; annual medical check-up; breast cancer screening*

78 *(mammography); cervical cancer screening (Papanicolaou smear); cholesterol screening;*  
79 *colorectal cancer screening (colonoscopy, sigmoidoscopy, faecal occult blood test); core set of*  
80 *clinical preventive services for older adults; health insurance coverage; and high blood pressure*  
81 *medication adherence.* All data are reported as an age-adjusted % prevalence of the respective  
82 health outcome or behaviour for each of the 500 included cities. Full details of the 500 Cities  
83 Project can be found in (10).

84

85 *Dun & Bradstreet Hoovers (11) – Performing Arts Activity*

86 Performing arts activity was estimated for each of the 500 cities included in the 500 Cities

87 Project by extracting annual revenue (2019) data for performing arts-related for- and non-profit

88 entities from the Dun & Bradstreet Hoovers database. Hoovers is the world’s largest commercial  
89 financial database including over 170 million businesses, and has been previously used to  
90 estimate cultural activity in US cities and analyse relationships between cultural activity and  
91 health outcomes (14). Performing arts-related entities were identified by eight-digit Standard  
92 Industrial Classification (SIC) codes (15), with 78 codes related to performing arts participation  
93 and/or receptive engagement selected for inclusion (Supplementary Table 1). All included SIC  
94 codes are related to participation and/or receptive engagement with live performing arts. SIC  
95 codes related to recorded performing arts were explicitly excluded given more tenuous links  
96 between revenue and performing arts participation/receptive engagement.

97 *US Census Bureau (12) – Demographic covariates*

98 Population, median per capita income and racial (% White, African-American, Hispanic) data  
99 were extracted from the most recent US Census (2010) for each of the 500 cities included in the  
100 500 Cities Project. Demographic data were extracted to serve as covariates given the  
101 demonstrated impact of economic and racial disparities on health outcomes (16, 17).

102 *Statistical analyses*

103 Relationships between performing arts activity and each health outcome were analysed using a  
104 series of hierarchical beta regression models. Beta regression has been shown to be ideal for  
105 effectively modelling proportion outcomes (*i.e. the 13 included health outcomes*) which are  
106 limited to the interval [0,1](18). Hierarchical modelling enabled consideration of established  
107 social and economic relationships between cities contained within the same metropolitan area;  
108 for example, hierarchical models could appropriately treat Santa Monica, Los Angeles (city), and  
109 Long Beach as related cities with the Los Angeles metropolitan area, rather than completely  
110 independent entities (19). Hierarchical models included two levels: Level 1 = metropolitan areas

111 including at least one of the analysed 500 cities; Level 2 = the individual 500 cities, coded and  
112 stratified by metropolitan area. Metropolitan areas were defined using Combined Statistical Area  
113 designations assigned by the US Office of Management and Budget in reflection of social and  
114 economic links between cities (20, 21).

115 Four hierarchical beta regression models were created using the *PROC GLIMMIX* procedure in  
116 SAS v9.4 (SAS Institute Inc., Cary, NC, USA) to analyse the relations between performing arts  
117 activity and each of the 13 health outcomes across the 500 included cities:

118 Model 1 – completely unadjusted

119 Model 2 – adjusted for demographic covariates (*median annual per capita income;*  
120 *population size; % White; % African-American; % Hispanic*)

121 Model 3 – adjusted for everything in Model 2 + prevalence of five unhealthy behaviours

122 Model 4 – adjusted for everything in Model 3 + prevalence of nine preventive behaviours

123 All models exceed recommended ratios of observation to predictor variables; additionally, a  
124 priori designation of covariates has been shown to minimize potential risks of overfitting (22).  
125 Variance Inflation Factors for predictor variables (*i.e. performing arts activity*) were checked to  
126 ensure that potentially problematic levels of multicollinearity (Variance Inflation Factor > 10)  
127 were not present (23). Using the logit link, odds ratios were derived from parameter estimates of  
128 each model (18); odds ratios are multipliers describing the impact of a \$1 billion increase in  
129 performing arts revenue on the % prevalence of each health outcome. Analyses of cancer  
130 prevalence were excluded due to particularly tight clustering of cancer prevalence data which  
131 precluded accurate modelling. Missing cervical cancer screening data from 47 cities were  
132 multiply imputed (10 imputations) using the *PROC MI* procedure (SAS v9.4); Model 4

133 parameter estimates were averaged across the 10 multiply imputed datasets using the *PROC*  
 134 *MIANALYZE* procedure (SAS v9.4). Data for all other investigated variables were complete.

	<b>Median</b>	<b>Minimum</b>	<b>Maximum</b>
Annual performing arts revenue (\$ - millions)	7.56	0.29	4186.22
Population	106,106	42,417	8,175,133
Median annual per capita income (\$)	29,031	14,509	90,042
<b><i>Racial Demographics (%)</i></b>			
White	72.2	12.3	96.8
African-American	9.7	0.0	84.9
Hispanic	16.4	1.0	96.8
<b><i>Health Outcomes (% prevalence)</i></b>			
Arthritis	22.0	13.3	33.9
Asthma	9.4	6.7	14.2
Chronic kidney disease	3.1	2.1	4.8
Chronic obstructive pulmonary disease	6.1	3.1	11.3
Coronary heart disease	5.7	3.5	8.8
Diabetes	10.3	5.6	20.3
High blood pressure	30.0	20.7	47.3
High cholesterol	29.5	24.1	34.1
Poor mental health	13.6	8.3	19.6
Poor physical health	12.7	7.0	20.5
Teeth lost (all)	14.5	5.1	31.8
Stroke	3.1	1.8	6.1
<b><i>Unhealthy Behaviours (% prevalence)</i></b>			
Binge drinking	17.7	6.2	25.4
Current smoker	17.2	7.9	29.6
Insufficient sleep	35.4	24.5	50.1
Physical inactivity	26.2	12.9	45.4
Obesity	30.5	15.3	49.1
<b><i>Preventive Behaviours (% prevalence)</i></b>			
Annual dental	63.4	41.8	81.5
Annual medical	67.9	54.2	81.3
Breast cancer screening	74.9	60.0	83.5
Cervical cancer screening	78.6	67.7	85.9
Cholesterol screening	79.8	70.2	85.2
Colon cancer screening	64.6	43.2	77.7
Health insurance	15.1	4.8	43.9
High blood pressure medication adherence	57.1	46.6	69.7
Preventive services – older men	34.0	19.4	53.3
Preventive services – older women	32.1	17.5	46.6

135 **Table 1.** Descriptive demographic, health outcome and behavioural data for the 500 analysed  
 136 cities.

137

138 **Results**

139 The 500 analysed US cities comprise 33.4% of the total U.S. population (103,020,808 people)  
140 and 84,010 performing arts businesses with a total annual revenue of \$27.84 billion. Of this total  
141 performing arts revenue, \$10.42 billion went to performing artists, \$11.84 billion went to  
142 performing arts production/support services, \$3.30 billion went to performing arts venues, and  
143 \$2.27 billion went to performing arts education. Median, minimum and maximum values for  
144 demographic and health and behavioural outcomes across the 500 analysed cities are detailed in  
145 Table 1.

146 <<INSERT FIGURE 1 ABOUT HERE>>

147 Fully adjusted regression models (Model 4) demonstrate statistically significant associations  
148 between increased performing arts activity and increased prevalence of chronic kidney disease,  
149 coronary heart disease, and stroke ( $p < .01$ ; Table 2). Odds ratios indicate that a \$1 billion increase  
150 in performing arts revenue is linked to increases in chronic kidney disease, coronary heart  
151 disease, and stroke by factors of 1.06, 1.13, and 1.11, respectively (Figure 1). For a hypothetical  
152 city of median population, performing arts revenue and incidence of health outcomes, Model 4  
153 demonstrates that a 100% increase in performing arts revenue would be associated with an  
154 additional 2, 6, and 3 cases of chronic kidney disease, coronary heart disease, and stroke,  
155 respectively. No other significant links between performing arts activity and health outcomes  
156 were found in fully adjusted models (Model 4;  $p \geq .17$ ).

157

158

159



Outcome	Model 1			Model 2			Model 3			Model 4		
	Parameter estimate	SE	p	Parameter estimate	SE	p	Parameter estimate	SE	p	Parameter estimate	SE	p
Arthritis	-0.045	0.039	0.25	0.062	0.059	0.29	0.011	0.039	0.78	0.009	0.037	0.81
Asthma	0.008	0.026	0.77	0.065	0.053	0.22	0.034	0.043	0.43	-0.018	0.037	0.53
Chronic kidney disease	0.047	0.027	0.09	0.103**	0.035	<0.01	0.061*	0.027	0.02	0.061**	0.023	<0.01
Chronic obstructive pulmonary disease	-0.00001	0.050	0.99	0.225**	0.081	<0.01	0.063	0.046	0.17	0.059	0.042	0.17
Coronary heart disease	0.025	0.034	0.47	0.207***	0.052	<0.001	0.115***	0.024	<0.001	0.120***	0.023	<0.001
Diabetes	0.077	0.044	0.08	0.057	0.063	0.37	0.001	0.036	0.98	0.036	0.033	0.28
High blood pressure	0.021	0.042	0.62	-0.029	0.061	0.63	-0.069	0.039	0.08	-0.012	0.035	0.73
High cholesterol	0.009	0.018	0.60	0.006	0.041	0.88	-0.017	0.035	0.62	0.022	0.032	0.51
Poor mental health	-0.001	0.036	0.97	0.169*	0.055	0.02	0.076*	0.035	0.03	0.041	0.031	0.19
Poor physical health	0.022	0.042	0.60	0.188**	0.059	<0.01	0.081*	0.034	0.02	0.043	0.029	0.14
Teeth lost (all)	0.071	0.067	0.29	0.376***	0.113	<0.001	0.177*	0.078	0.02	0.041	0.063	0.52
Stroke	0.064	0.037	0.09	0.204***	0.045	<0.001	0.122***	0.030	<0.001	0.102***	0.025	<0.001

160

161 **Table 2.** Hierarchical beta regression results describing the relationships between performing arts activity and all health outcomes \* -  
162 p<.05; \*\* - p<.01; p<.001. Model 1: Unadjusted. Model 2: Adjusted for population size, median annual per capita income, and racial  
163 demographics (% White; % African-American; % Hispanic). Model 3: Adjusted for all in Model 2 + prevalence of unhealthy  
164 behaviours. Model 4: Adjusted for all in Model 3 + prevalence of preventive behaviours.

165

166 **Discussion**

167 This secondary analysis of performing arts activity and health outcome data across 500 US cities  
168 representing 1/3 of the total US population revealed minimal links between community-level  
169 performing arts activity and health outcomes. Fully adjusted models only revealed statistically  
170 significant relationships between performing arts activity and an increased incidence of three of  
171 twelve investigated health outcomes: chronic kidney disease, coronary heart disease, and stroke  
172 incidence. However, the public health implications of these statistically significant links are  
173 equivocal – models indicate that considerable 100% increases in performing arts revenue would  
174 be linked to only single digit increases in disease incidence in most analysed cities. Such small  
175 but statistically significant associations in observational epidemiologic research have been shown  
176 to be most likely the result of uncontrolled bias and thus unlikely to be credible (24-26). Further,  
177 performing arts participation has been shown to positively impact chronic kidney disease,  
178 coronary heart disease and stroke risk factors (*e.g. body composition; inflammation*) in prior  
179 studies (1); no links between performing arts activity and increased incidence or risk factors for  
180 these diseases have been reported (1, 2). Accordingly, the results of this analysis are judged to  
181 illustrate an absence of *clinically* significant associations between performing arts activity and  
182 health outcomes – the remainder of the discussion has been written on this basis.

183 Given the broad benefits of performing arts participation and receptive engagement related to a  
184 range of health outcomes (1, 2), the absence of links between community-level performing arts  
185 activity and health outcomes in the present study was unexpected. However, null results of the  
186 present study are far from the exception in epidemiologic studies investigating performing arts  
187 impact. Only one of three studies found a positive effect of performing arts activity on all-cause  
188 mortality (5, 27, 28), while two of three studies have demonstrated protective effects of

189 performing arts activity on dementia incidence (3, 7, 29). Methods of evaluating performing arts  
190 participation and receptive engagement vary across this and prior epidemiologic studies, with a  
191 notable dearth of validated and/or psychometrically tested approaches. Taken together, variation  
192 in the content and psychometric rigour of evaluation methods seems likely to be at least partially  
193 responsible for the present prevalence of mixed results.

194 In the present study, use of annual performing arts revenue to estimate performing arts activity is  
195 a notably indirect assessment approach and a key limitation. The authors hypothesized that the  
196 health impact of the performing arts would be robust enough to tolerate such indirect estimation  
197 methods, particularly given the availability of a wide array of behavioural and demographic  
198 covariates which would theoretically permit the detection of smaller effects. However, results  
199 indicate that the effects of performing arts activity may be smaller and/or more specific than  
200 predicted. Additionally, associations between performing arts revenue and participation/receptive  
201 engagement may be weaker than prior research (14) suggests. And alternately, performing arts  
202 activity may simply have no effect on broad health/disease outcomes. Further epidemiologic  
203 research using a consensus, psychometrically tested approach to evaluating performing arts  
204 activity is required to more confidently and precisely quantify performing arts effects.

205 Notably, studies which more directly assessed performing arts activity – e.g. questionnaires  
206 regarding the type and/or frequency of performing arts activities – have also returned conflicting  
207 null and positive results (3, 5, 7, 27-29). This suggests that direct assessment methods are not  
208 inherently the solution. However, one prior study interrogating links between dancing and  
209 cardiovascular disease mortality provides guidance regarding an approach that could be  
210 expanded to evaluate performing arts more broadly (6). This study used a validated interviewer-  
211 administered questionnaire to quantify the frequency, duration *and* physical intensity of dancing,

212 finding that moderate, but not light, intensity dancing was linked to reduced cardiovascular  
213 disease mortality.

214 While physical intensity is not relevant to many forms of performing arts participation and  
215 receptive engagement, direct assessment of the physiologic response to performing arts activity  
216 appears likely to facilitate better evaluations of performing arts' impact on health outcomes.  
217 Physiologic responses to performing arts have been shown to be highly variable, even within the  
218 same type of performing arts participation or receptive engagement – in a particularly clear  
219 example, performing or listening to the same piece of music can elicit a significant physiologic  
220 response in one individual but no response in another, both on average and during emotional  
221 'peaks' in the music (1, 30-35). Evidence from other domains, in particular physical activity, has  
222 demonstrated clear links between the short-term physiologic responses to activities and their  
223 long-term impact on disease and mortality (36, 37). Similar links between short-term physiologic  
224 responses to performing arts activities and long-term health outcomes seem likely, underscoring  
225 the prospective importance of evaluating these physiologic responses in future epidemiologic  
226 research.

## 227 **Conclusions**

228 This study contributes to a growing body of conflicting epidemiologic evidence regarding the  
229 health impacts of performing arts activity, revealing no relationships between community-level  
230 performing arts activity and health/disease outcome across 500 cities in the US. However,  
231 considering the context, results should be interpreted as an impetus to refine and consolidate  
232 presently disparate evaluation methods, rather than as conclusive insights regarding the impact of  
233 performing arts activity on community-level health. A consensus, psychometrically rigorous

234 method of evaluating performing arts participation and receptive engagement is required to  
235 address this prevailing uncertainty in future epidemiologic studies.

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## 240 **Conflicts of Interest**

241 The authors have no conflicts of interest to declare.

242

243

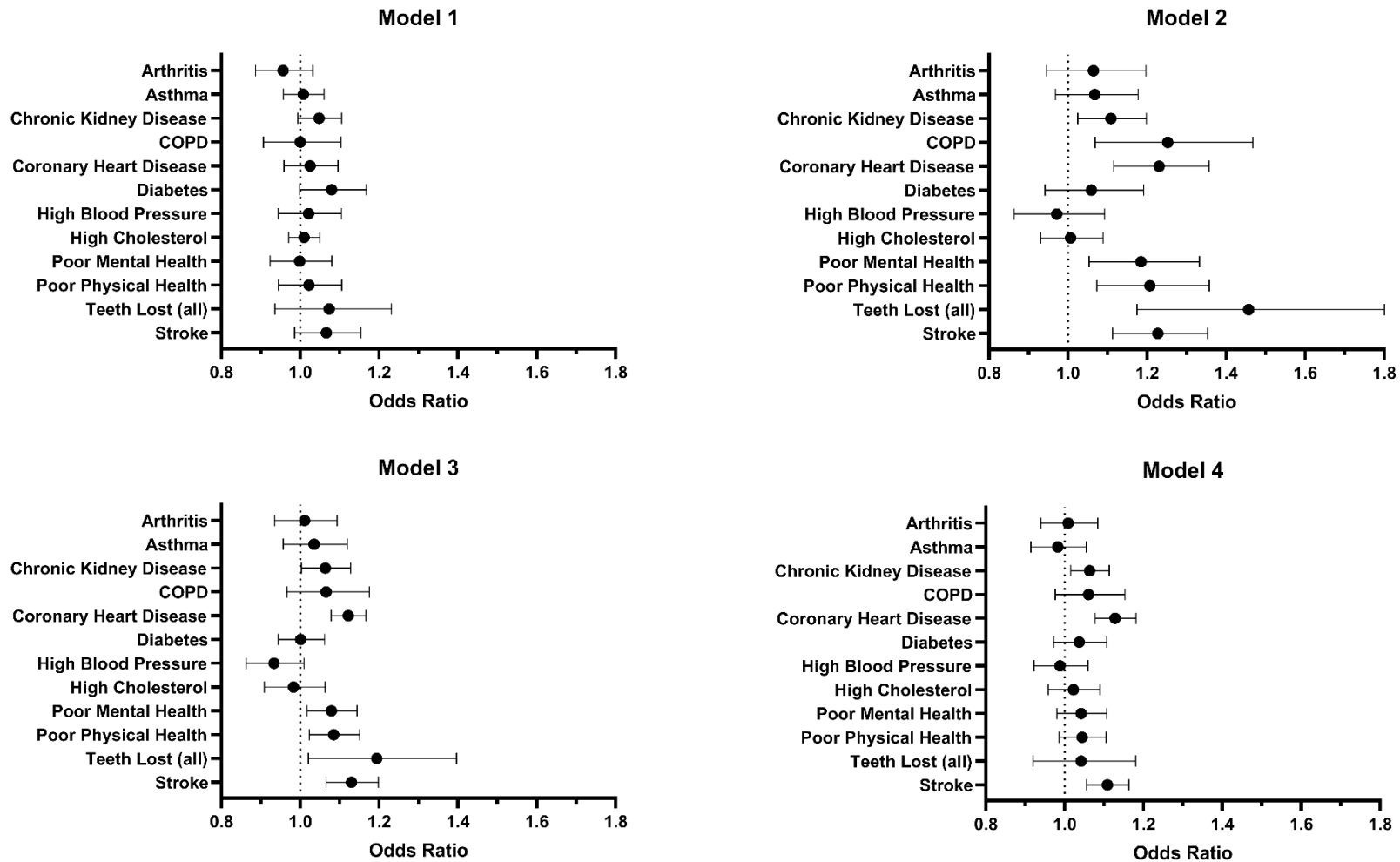
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327



**Figure 1.** Odds ratios ( $\pm$  95% confidence interval) generated from hierarchical beta regression results using the logit link (18). Odds ratios are multipliers describing the impact of a \$1 billion increase in performing arts revenue on the % prevalence of each Health Outcome.





## Group singing for health and wellbeing in the Republic of Ireland: the first national map

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# Group singing for health and wellbeing in the Republic of Ireland: the first national map

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## Keywords

group singing; singing; choir; social prescribing; health; wellbeing

## Abstract

**Aims:** (1) To catalogue and map all singing for health and wellbeing groups in the Republic of Ireland (ROI); (2) determine how they prioritise health outcomes; (3) understand what they consider success; and (4) identify gaps in provision.

**Methods:** A novel mixed-methods survey was distributed electronically through SING Ireland (the Choir Association of Ireland), artsandhealth.ie, and to 2736 potential stakeholders with links to singing for health and wellbeing and singing on social prescription (SSP) from October 2020 to April 2021. Thematic analysis was used to analyse four open-ended survey questions.

**Results:** A total of 185 singing for health and wellbeing groups were identified, with varied representation in each of the ROI's 26 counties. 35 groups were noted to have links to SSP. Gaps in provision for clinical and individual populations and for SSP were identified. Six themes related to the success of group singing for health and wellbeing programmes were determined: fostering and funding social and community connections; the people and the approach; enjoyment and atmosphere; musical and personal growth, programmatic structure and musical content; and the impact of Covid.

**Conclusion:** The first-ever national mapping of group singing for health and wellbeing in the ROI, and one of few internationally, this study may serve as a roadmap for gathering information about existing singing for health and wellbeing provision and identifying geographical and clinical gaps internationally. Recommendations are included for future research to address gaps in provision, explore the feasibility of integrating SSP more widely and for further public health investment.

## INTRODUCTION

The evidence supporting the health and wellbeing benefits of group singing continues to expand.<sup>1,2</sup> Increased feelings of social connection, happiness and rejuvenation,<sup>3</sup> and enhanced memory and coping skills<sup>4</sup> have been documented for individuals with dementia and their carers. Older adults living in the community reported lower levels of anxiety and depression,<sup>5</sup> posture improvement,<sup>6</sup> and diminished feelings of social isolation.<sup>7</sup> Participation in an intergenerational choir has led to increased self-confidence for both older and younger members<sup>8</sup> and lower anxiety for children at risk of academic failure.<sup>9</sup>

Group singing has provided positive experiences for individuals with cancer,<sup>10</sup>

respiratory wellbeing for people with chronic obstructive pulmonary disease (COPD),<sup>11</sup> and improvements in vocal quality of life for individuals with Parkinson's disease.<sup>12</sup> Psychological and emotional benefits have been noted for the general public,<sup>13</sup> homeless and marginalised individuals,<sup>14</sup> and members of all-female singing groups.<sup>15,16</sup> Adults with a chronic mental health condition and/or an intellectual or physical disability have experienced social, emotional, and practical gains.<sup>17</sup> The positive impacts of singing in a workplace choir for staff-only groups<sup>18,19</sup> and groups comprised of both staff and service users<sup>20</sup> have also been documented.

Similar emotional, social, and practical gains have been experienced by Arts on Prescription (AoP) participants,<sup>21</sup> a branch of social prescribing

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(SP). SP is an alternative or addition to pharmacological intervention wherein primary care physicians and healthcare professionals refer individuals with a range of needs to community link workers. Also known as SP coordinators, these individuals are knowledgeable about voluntary and community opportunities and connect referees with local, non-clinical, health, and wellbeing supports.<sup>22</sup> The first documented SP project in the Republic of Ireland (ROI) took place in county Donegal in 2013.<sup>23</sup>

SP endeavours to combat inequity of access to healthcare by addressing economic and social factors, 'Social Determinants' that are the most significant predictors of health.<sup>24</sup> A global issue, the ROI faces this challenge. Described as having a 'two-tiered' healthcare system, individuals who are able to purchase private insurance enjoy easier access to healthcare.<sup>25</sup>

Singing on social prescription (SSP) could serve as a tool to combat this inequity of access. First, a better understanding of provision and gaps in provision of group singing for health and wellbeing in the ROI is required.<sup>26</sup> The creation of the first publicly accessible, living map of group singing for health and wellbeing in the ROI is a critical part of this investigation and will help overcome two identified barriers to the successful implementation of SP: inconsistent record keeping and the loss of organisational knowledge through frequent staff turnover.<sup>27</sup>

### METHODS

This research was conducted by a small university team. The aims of this research were to catalogue and map all singing for health and wellbeing groups in the ROI, determine how they prioritise health outcomes, understand what they consider success, and identify gaps in provision. A novel mixed-methods survey comprised of 35 open- and closed-ended questions and informed by the Singing Europe Online Questionnaire<sup>28</sup> was distributed electronically from October 2020 to April 2021 (Appendix 1). Data were collected on rehearsal/meeting locations, links to SP, choir demographics, leadership training,

programmatic aims and priorities, and adaptations made for COVID.

The survey was distributed through the electronic mailing lists of SING Ireland (the Choir Association of Ireland) and artsandhealth.ie. 2736 potential stakeholders with links to singing for health and wellbeing and SSP were contacted via publicly accessible email addresses and social media, including university music departments, independent music schools, SP coordinators, health promotion officers, arts councils, organisations supporting individuals with disabilities, private and public hospitals, music therapy and community musician groups, community music and arts centres, libraries, branches of Music Generation, and branches of the Alzheimer's Society. The list of potential stakeholders was compiled by the authors.

### Participants

A total of 224 responses were collected. Groups based outside of the ROI ( $n=4$ ) and respondents completing the survey on behalf of themselves as a solo singer ( $n=1$ ) were excluded. Informed consent was obtained to publicly share singing for health and wellbeing groups as a local resource. Individual participant information was kept confidential. Following deduplication, 210 survey responses remained for analysis, comprising 185 singing for health and wellbeing groups.

81.4% of respondents ( $n=171$ ) completed the entire survey. A total of 39 questionnaires were partially completed (83% completed,  $n=4$ ; 64%,  $n=22$ ; 28%,  $n=12$ ; 3%,  $n=1$ ). In instances of partially completed surveys, data pertinent to the primary aims of the study, such as name of singing group and location of service, were included.

### Procedure

Ethical approval for this study was received from the University of Limerick's AHSS Research Ethics Committee. The questionnaire was created in Qualtrics. Potential informants received an email invitation with a link to the survey. Social media was utilised (i.e. Twitter and Facebook). Snowball sampling was

employed as it has proven effective in gathering more obscure data.<sup>29</sup> Survey data were analysed with SPSS 26 and only descriptive statistics were used.

Four open-ended questions were included:

1. Other priorities outside the seven options provided in the survey (Appendix 1).
2. What are the key ingredients that make this singing group successful?
3. What is one sentence that really gets to the core of how this programme prioritises the health and wellbeing of its participants?
4. Is there anything else you would like to add?

Qualitative responses were analysed using Braun & Clarke's<sup>30</sup> six-step framework for thematic analysis. The first author completed steps 1 to 4 (familiarising yourself with your data; generating initial codes; searching for themes; reviewing themes and generating a thematic map). Candidate themes and initial codes were reviewed by the second author, who confirmed the data linked to the themes identified. The two authors completed steps 5 (defining and naming themes) and 6 (producing the report) together. Themes were selected based on relevance rather than frequency counts, as this type of quantitative presentation can be limited in portraying the meaning and value of qualitative findings.<sup>31</sup>

## RESULTS

### County

Singing for health and wellbeing groups were identified in each of the ROI's 26 counties. In addition, seven nationwide, virtual groups were reported. County Dublin had the largest number of singing for health and wellbeing groups ( $n=42$ ). Counties Monaghan and Leitrim only had one each. A total of 92 groups (49.7%) were located in Dublin, Cork, Limerick, or Galway. Figures 1 and 2 outline total singing groups per county.

### Links to social prescribing

Respondents could note various sources of recruitment. In total, 33 groups across 13 counties, and 2 virtual groups, were

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Figure 1

Map of singing groups per county.

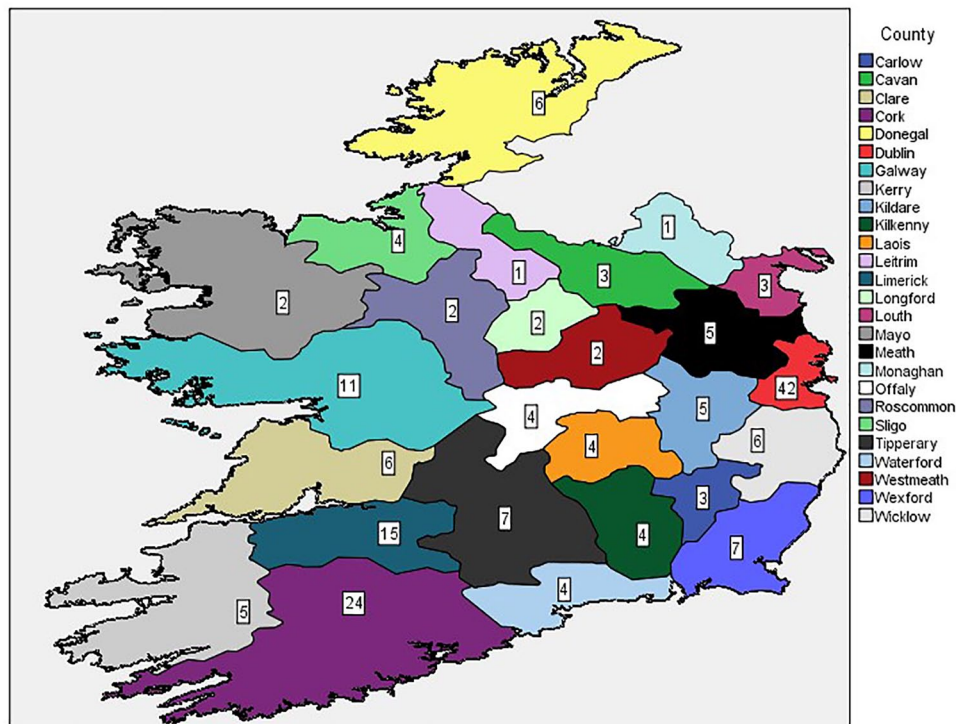
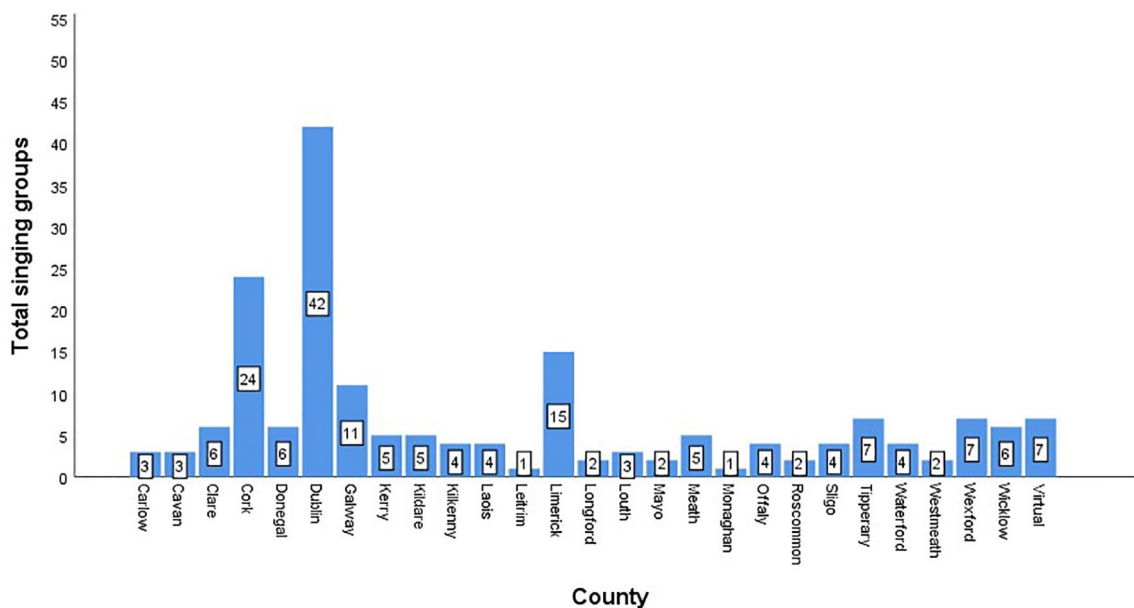


Figure 2

Bar graph of singing groups per county.



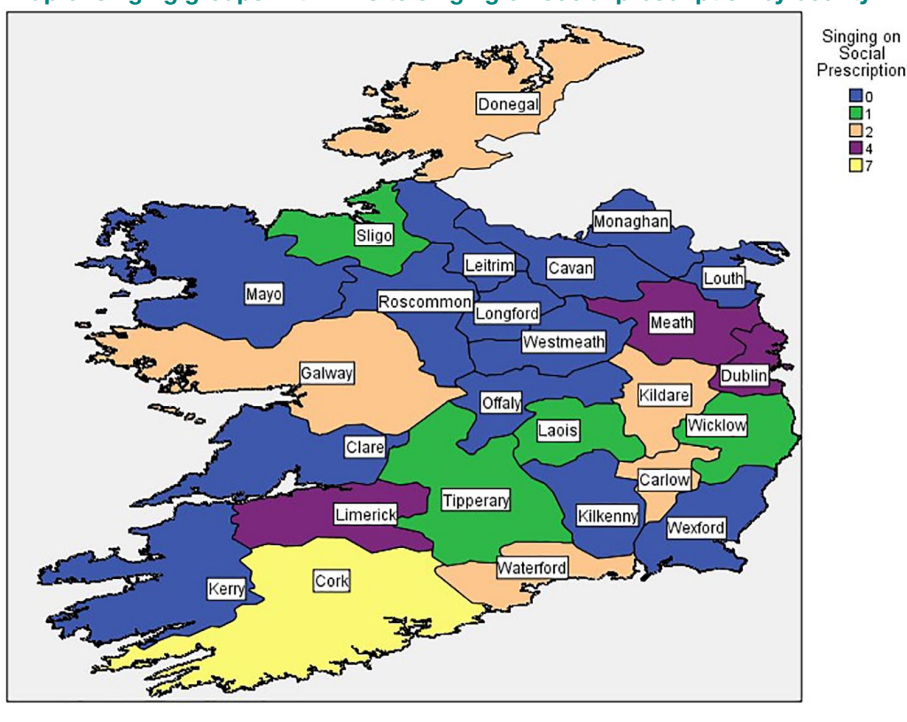
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Table 1

Singing groups with links to singing on social prescription per county	
County	Singing on SP groups per county
Cork	7
Dublin, Limerick, Meath	4
Carlow, Donegal, Galway, Kildare, Waterford Virtual	2
Laois, Sligo, Tipperary, Wicklow	1

Figure 3

Map of singing groups with links to singing on social prescription by county.



considered to have links to SP as either a referral from a community link worker or healthcare professional was selected as one source of recruitment.

Table 1 outlines total singing groups with links to SP per county. Figure 3 displays the same information with counties separated by colour. Counties in blue did not report any links to SP.

**Choir demographics**

Approximately 6265 individuals (4488 female, 1773 male, 4 do not identify as female or male) were members of singing for health and wellbeing groups. 61.4%

( $n=3845$ ) were members of groups open to anyone, including individuals with health conditions or additional needs, and 38.6% ( $n=2420$ ) were members of groups targeting a particular population. Demographics are detailed below.

**Age and gender**

A total of 158 groups reported singing group demographics for targeted ( $n=80$ ) and open groups ( $n=79$ ). The most common age range was 26–64 for both female ( $n=2493$ ) and male ( $n=870$ ) singers.

A breakdown of age and gender demographics is included in Table 2.

**Singing groups that target clinical or individual populations**

A total of 171 groups specified being open to anyone ( $n=81$ ) or targeting a clinical, non-clinical, or individual population for membership ( $n=90$ ). Fifty-six of the 90 targeted groups, specifically for clinical or individual populations, are detailed below.

**Clinical and individual populations**

**Workplace choirs**

The most common targeted singing groups were workplace choirs ( $n=21$ ) for current or retired staff and/or family members of hospitals, prisons, electronic companies and universities, and groups targeting older adults ( $n=12$ ), including: retirees ( $n=4$ ); older adults living in the community ( $n=5$ ); persons with dementia and their carers ( $n=2$ ); and older adults who utilise a day care centre ( $n=1$ ).

Eleven groups targeted individuals and supporters affected by illnesses or injuries such as cancer ( $n=2$ ); a mental health condition ( $n=2$ ); Parkinson’s disease ( $n=2$ ); stroke ( $n=1$ ); acquired brain injury ( $n=1$ ); COPD or other chronic lung diseases ( $n=1$ ). There were groups for individuals with physical disabilities ( $n=2$ ), adults with intellectual disabilities ( $n=1$ ), adults with intellectual disabilities and transition year students ( $n=1$ ), and adults with intellectual disabilities and/or a mental health condition ( $n=1$ ).

Less common were groups for individuals faced with the trauma of homelessness ( $n=1$ ); people in specific circumstances (e.g. recovering from mental health, addiction, facing difficulties) ( $n=1$ ); and residents of a particular area ( $n=1$ ).

Provision of singing groups for individual and clinical populations is outlined in Table 3 and Figure 4. Eight counties indicated no provision and seven counties reported one singing group each.

**Non-clinical populations**

In total, 12 singing groups targeted young people or students and 11 were solely for men ( $n=6$ ) or women ( $n=5$ ). Appendix 2 includes a full list of clinical, non-clinical, and individual populations.

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Table 2

Age and gender demographics of singing for health and wellbeing groups					
	≤15	16–25	26–64	65+	Total
Targeted groups ( <i>n</i> = 80)					
Female	234	123	750	567	1674
Total groups	11	12	51	31	
Male	45	82	327	288	742
Total groups	8	12	46	32	
Do not identify as female or male	3	1	0	0	4
Total groups	1	1	0	0	
Open groups ( <i>n</i> = 79)					
Female	126	90	1743	830	2814
Total groups	8	20	70	49	
Male	37	28	543	423	1031
Total groups	8	10	60	45	
Do not identify as female or male	0	0	0	0	0
Total groups	0	0	0	0	

targeted groups; 40% (*n* = 30) ran one of the 81 open groups. A total of 64 types of relevant trainings were noted, most commonly: music therapy (*n* = 16); post-secondary degree in a music-related discipline (*n* = 8); community music (*n* = 5); and music teacher (*n* = 4). A full list of relevant trainings is included in Appendix 3.

#### Programmatic aims and priorities

Participants were asked to indicate if the following were programmatic priorities: a professional level of artistic production; singers' general wellbeing; singers' health; socialisation of singers; social integration; singing for pleasure/leisure; producing public concerts; and other.

A total of 131 groups responded. Singing for pleasure/leisure, socialisation, wellbeing, health, and social integration were top priorities. Producing public concerts and a high level of artistic production were slightly lower priorities. In total, 27 groups indicated 'other priorities', such as learning a skill or providing entertainment in nursing homes, as a primary aim.

#### Adaptations made for COVID

A total of 112 groups continued to meet after the Covid pandemic cancelled in-person singing groups. 87.5% (*n* = 98) incorporated a virtual component. Zoom was the most frequently used platform. Nine groups created virtual video projects, eight met outside when able, and one group leader made and sent CDs to those without Internet access.

#### Membership costs

In total, 68 (36.8%) groups were free to join. 50.8% (*n* = 94) had a variety of associated membership costs, ranging anywhere from €2 per rehearsal to €400/term. Most common were annual fees (*n* = 49), with an average cost of €175/year and a mode of €5/session (€260/year).

#### Rehearsal and performance

81.6% of choirs (*n* = 151) rehearsed weekly, most commonly for 1–2h (*n* = 94) or 1h (*n* = 52). A total of 156 individuals reported on performance schedule. Most performed between two and four times a year (*n* = 99) or annually (*n* = 20).

Table 3

Provision of singing groups for individual and clinical populations per county		
Provision per county	# of Counties	County name
0	8	Leitrim, Longford, Louth, Mayo, Monaghan, Roscommon, Sligo, Wexford
1	7	Cavan, Clare, Donegal, Kilkenny, Meath, Waterford, Wicklow
2	5	Carlow, Kerry, Offaly, Tipperary, Westmeath
3	2	Kildare, Laois
4	1	Galway, Virtual
5	2	Cork, Limerick
15	1	Dublin

Auditions were not required for most singing groups (*n* = 137). A total of 138 (74.6%) groups met in a location easily accessible by public transportation.

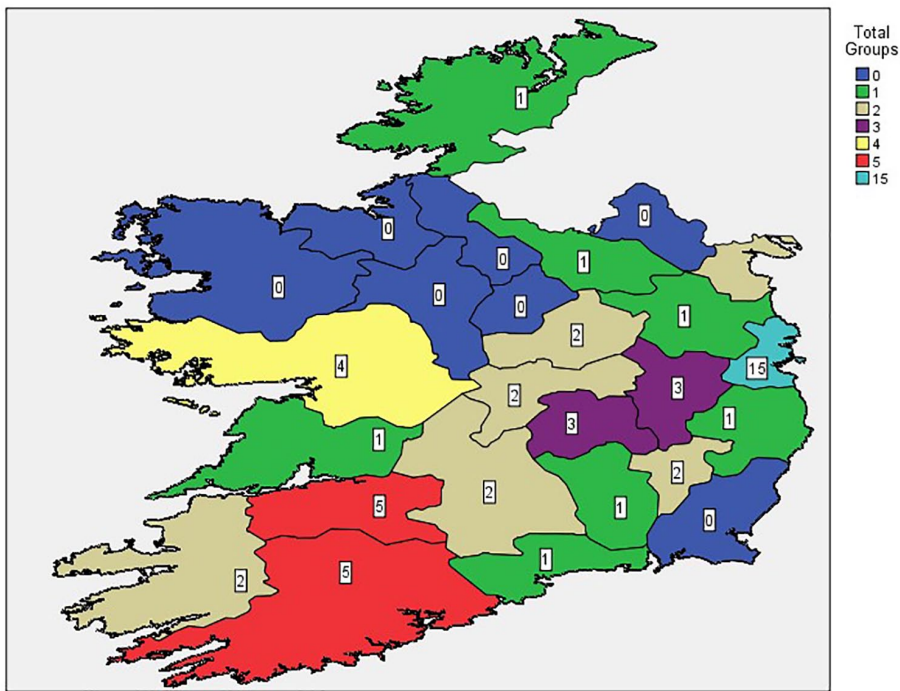
#### Leadership training

In total, 75 choir leaders received specialised health and/or wellbeing training. 60% (*n* = 45) ran one of the 90

Group singing for health and wellbeing in the Republic of Ireland: the first national map

Figure 4

Map of singing groups for individual and clinical populations by county.



resource and financial backing. This is not about professions, power, personal financial gain but rather this is about finding ways to positively improve the health of our people which has to be a priority particularly now.

*The people and the approach*

The group leader, singers, and support staff were considered vital to the success of singing groups. Optimal group leaders were enthusiastic, professional, and committed, with excellent interpersonal and group facilitation skills. Professional training in music therapy, experience conducting choirs, and utilisation of the existing evidence base to support singers were instrumental.

Exemplary approaches were outlined: spreading a ‘we can do this’ attitude; motivating singers to do their best by combining hard work with fun; setting appropriate expectations; and supporting choral aims such as nurturing creativity, providing singers with a sense of purpose (e.g. concerts, original compositions), and promoting confidence and self-esteem.

Having enthusiastic, friendly, and supportive members with a shared interest (singing) contributed to group cohesion. Dedication to the group, both musically and as a peer support, was also noted. In some cases, though, performances were not a priority, and less emphasis was placed on rehearsing between sessions. In these instances, individuals weren’t ‘rehearsing’, simply meeting to gather and sing.

The importance of committee members, volunteers, and support staff was also highlighted, particularly in terms of organising finances, concerts, publicity, and providing technical support:

*... A competent and enthusiastic musical director is essential. A committee which manages finances, organization of concerts and publicity is also essential.*

*Living well with Parkinson’s Disease using the 5 Elements model developed by Move 4 Parkinson’s.*

**Qualitative themes**

In total, 386 responses were coded and analysed and 6 themes were identified: fostering and funding social and community connections; the people and the approach; enjoyment and atmosphere; musical and personal growth; programmatic structure and musical content; and the impact of Covid.

*Fostering and funding social and community connections*

Various types of local, national, and international connections were emphasised: reviving the singing tradition of a particular town, singing at religious services, and supporting individuals who may be isolated or vulnerable; performing tributes to Irish composers; linking in with the wider choral community.

Raising funds for local and national causes, and for singing groups, was also articulated. Support from local authorities, nongovernmental organisations (NGOs) and concert revenue, and donations from singers to pay group leaders were considered critical for success. Conversely, a lack of

financial support was cited as a failing and disservice to the general population. Low financial expectations of singers encouraged membership and promoted inclusivity and accessibility:

*Regular visits to nursing/care homes locally promote interaction in a musical setting rather than performance ... Weekly rehearsals are geared toward an annual presentation of about 16 choral ... items and usually feature a tribute to an Irish composer ...*

*Outlet for people who never meet with anyone[.] We look out for vulnerable and elderly people who have joined the [choir].*

*We all know music and song is good for your health. Choirs ... need to be recognised for what they are, a very important health enhancing tool particularly in these strange times where the pandemic has impacted heavily on mental health across the country. These programmes should be main streamed with proper human*

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*The social interaction and support between stroke survivors. It reduces feelings of isolation and self-consciousness as each member is a stroke survivor and will support and not judge his fellow member.*

### Enjoyment and atmosphere

The singing environment was significant. Descriptors such as safe, relaxed, informal, joyful, friendly, non-threatening, supportive, and inclusive were used repeatedly. A home-like, community feel, supporting a sense of equality and belonging, regardless of age or ability, was depicted as ideal, particularly for reaching isolated or marginalised individuals, and those in need of an escape from stressful jobs or life situations. There were overlaps with the theme 'fostering and funding social and community connections' as environment could be key in enabling the creation of connections:

*It's welcoming, everyone is treated equally and it's an excellent way to escape from [life's] problems.*

*To give people a safe, fun way of detaching from their worries and cares and promote positive mental health.*

*To offer a space for young mums to meet up, not enough support, and reach out to postpartum mums in our village community and for these mums social connections are key and time out of the week just for themselves without guilt.*

### Musical and personal growth

Social, emotional, and musical opportunities and benefits were priorities and key ingredients of successful group singing programmes. Social benefits included the opportunity to make lifelong friends, be part of a choral family, and connect with others undergoing similar challenges. A safe, inclusive atmosphere allowed for emotional expression and exploration. Respondents noted the transformative impact singing together could have on members' moods. Foci such as improved listening,

communication, and social skills, the development of a routine and introduction to a, potentially, lifelong activity were outlined.

Group singing also provided musical opportunities: learning to use the voice as an instrument, receiving musical training and performing. A handful of respondents did note, however, that health and wellbeing were valuable by-products of group singing but not specific priorities. Collectively, the cultivation of transferable skills, in partnership with a supportive environment, helped build confidence and self-esteem:

*Creating a greater awareness of the voice as a musical instrument to provide a music education and life-long activity to the many children, young people and adults who never got or may never get the opportunity to play a music instrument due to personal circumstances, especially relating to availability of financial resources.*

*There is no doubt that many people arrive frazzled and leave cheerful.*

*Many older people were discouraged from singing in childhood. They find this a loss and need great encouragement. Also, as they are adults, they need a challenging musical experience so it is important to balance these two issues.*

### Programmatic structure and musical content

Structure, organisation, and clear communication were considered necessary. Being mindful of singer's availability and needs when choosing rehearsal time and location was crucial, as was repertoire selection. Singers were often encouraged to select repertoire, an intentional choice made by group leaders in order to empower and support members' sense of ownership. Variety, genre, mood, and complexity of songs and the inclusion of warmups specific to singers' health and wellbeing needs were also mentioned:

*[A]ccessible repertoire of meaningful songs and chants from all over the world ...*

*The singing sessions combine vocal exercises and breath work to improve vocal problems with an additional focus on singing familiar and joyful songs to improve health and wellbeing.*

*Good boundaries and organisational skills. Creating a safe environment and having some housekeeping rules for everyone to understand.*

### Impact of Covid

Group leaders were commended for their adaptability, creativity, and flexibility in keeping singers connected during Covid. Virtual efforts such as the creation of DVDs, remote music videos, and virtual singalongs were highlighted, with online sessions focusing on alternative ways of singing together. In some instances, the virtual aspect helped increase membership.

There were, however, drawbacks to connecting virtually, such as screen fatigue, decreased membership, preference for in-person meetings, and challenges to connect with individuals facing digital poverty. A longing to sing together again was noted, with the inability to meet creating a 'vacuum in [our] lives'. Highly anticipated performances, gigs, and the potential for newer singing groups to grow were viewed as lost opportunities. These losses prompted a realisation of how significant group singing was for socialisation, peer support, relaxation, health and wellbeing, distraction, enjoyment, and providing a purpose. Concern was expressed over the future of group singing and whether it would ever feel safe again:

*Being adaptable especially now. Using creative ways to reach out to the Choir and to keep them all Singing. Our Remote Music Videos have been really successful and have also given the entire hospital community a positive distraction during this time.*



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Table 4

Singing for health and wellbeing groups per capita			
		% of 185	Share of total population 2016
Carlow	3	1.6	1.2
Cavan	3	1.6	1.6
Clare	6	3.2	2.5
Cork	24	13.0	11.4
Donegal	6	3.2	3.3
<b>Dublin</b>	<b>42</b>	<b>22.7</b>	<b>28.3</b>
Galway	11	5.9	5.5
Kerry	5	2.7	3.1
<b>Kildare</b>	<b>5</b>	<b>2.7</b>	<b>4.7</b>
Kilkenny	4	2.2	2.1
Laois	4	2.2	1.8
Leitrim	1	0.5	0.7
Limerick	15	8.1	4.1
Longford	2	1.1	0.9
<b>Louth</b>	<b>3</b>	<b>1.6</b>	<b>2.7</b>
<b>Mayo</b>	<b>2</b>	<b>1.1</b>	<b>2.7</b>
<b>Meath</b>	<b>5</b>	<b>2.7</b>	<b>4.1</b>
Monaghan	1	0.5	1.3
Offaly	4	2.2	1.6
Roscommon	2	1.1	1.4
Sligo	4	2.2	1.4
Tipperary	7	3.8	3.4
Virtual	7	3.8	N/A
Waterford	4	2.2	2.4
Westmeath	2	1.1	1.9
Wexford	7	3.8	3.1
Wicklow	6	3.2	3

Provision that is more than 1% below population share is shown in bold.

*The loss of the choir from covid is hard on all staff. At a time that staff need to [de-stress] and singing is not possible. We are working hard on risk assessment to try and restart the choir in 2021.*

*It has been an interesting development that our new term this September saw 4 new members join the choir, even though we can only rehearse online at present. This shows that people value being in a choir as they know it is good for their health, especially in this time of the global pandemic.*

## DISCUSSION

This research contributes the first mapping of singing for health and wellbeing in the ROI and one of the first internationally. Several gaps in group singing for health and wellbeing provision were identified. Nearly half of all reported groups were located in just 4 of the ROI's 26 counties. Interestingly, this provision is fairly consistent with the general population distribution. The percentage of singing groups per county mostly fell within 1% of that county's share of the total population (Table 4) based on the 2016 census.<sup>32</sup> Further research into aligning singing for health and wellbeing provision with clinical need is recommended, in addition to ensuring equity of geographical access for people with specific diagnoses. Partnerships with healthcare professionals, stakeholders and members of the Republic of Ireland's publicly funded healthcare agency, theHSE, would be useful.

Gaps in provision for clinical populations were also identified. Eight counties did not report any provision for clinical or individual populations; an additional seven only had one singing for health and wellbeing group each. This gap is significant considering that in 2021 there were 170,000 individuals living with or beyond cancer in Ireland,<sup>33</sup> yet only two singing groups for individuals with cancer were reported. Further research on addressing gaps in provision for clinical and individual populations would be

## Group singing for health and wellbeing in the Republic of Ireland: the first national map

beneficial, particularly through SSP initiatives.

18.9% ( $n = 35$ ) of singing groups indicated possible links to SSP. Considering the potential cost-effectiveness of both group singing and SP,<sup>34,35</sup> it would be valuable to explore the feasibility of expanding SSP in the ROI by identifying current models of best practice.

Overall, far more women participated in singing for health and wellbeing than men. Of the 6265 singers reported, 71.6% were female, highlighting a common gender imbalance within singing groups.<sup>36</sup> Further research and consultation with experts are recommended to understand the needs of men, people from culturally diverse backgrounds and why particular populations are less prone to participate in such singing groups.

A wide range of professions and trainings deemed relevant for running a singing for health and wellbeing group confirms literature in the field.<sup>3</sup> A lack of heterogeneity regarding training and

overall programmatic structure is also notable. Both merit further research.

### CONCLUSION

While there is a growing body of evidence around the health and wellbeing benefits of group singing, there is a paucity of national mapping investigations. This study outlined the motivation, methodology, and findings of the first-ever national mapping of group singing for health and wellbeing in the ROI and one of few internationally. It may serve as a roadmap for gathering information about existing provision and identifying geographical and clinical gaps internationally.

The authors hope this study will serve as a springboard for the continued growth and development of a national and international map of group singing for health and wellbeing, a potentially instrumental resource for singers, referrers, and stakeholders.

Several gaps in provision have been identified for SSP and various populations. Recommendations are

included for future research to address these gaps and explore the feasibility of integrating SSP more widely. The authors hope these findings will inform healthcare policy and encourage greater financial allocation for group singing for health and wellbeing. The evidence to date supports singing for health and wellbeing as a potentially cost-effective intervention.<sup>34</sup> Further public health investment and research is warranted.

### CONFLICT OF INTEREST

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**APPENDIX 1**  
**Online survey**

Mapping singing for health and wellbeing in the Republic of Ireland

**CONTACT**

Name of choir or singing group: \_\_\_\_\_

Location of service: \_\_\_\_\_ Year Established: \_\_\_\_\_

Contact Email address: \_\_\_\_\_ Contact Phone number: \_\_\_\_\_

Website: \_\_\_\_\_

Is this service affiliated/part of another organisation? \_\_Y \_\_N

If yes, which organisation: \_\_\_\_\_

And does this organisation run other singing groups? \_\_Y \_\_N

**ABOUT YOUR GROUP**

Please estimate the total number of choir members at the start of 2020 (pre-Covid).

	<15 years old	16–25	26–64	65+
Female				
Male				
Do not identify as female or male				

Is this singing group open to any member of the community or does it target a specific population?

\_\_Open to anyone – come one come all!

\_\_Targets a specific population

Do participants need to audition to join? \_\_Y \_\_N

If a specific population is targeted (e.g. individuals with dementia), how would you describe the target population? \_\_\_\_\_

\_\_\_\_\_

## Group singing for health and wellbeing in the Republic of Ireland: the first national map

Ordinarily, the singing group meets/rehearses:

Weekly

Monthly

Occasionally as time allows

Only to prepare for specific performances

Other, please describe: \_\_\_\_\_

Rehearsals typically last:

An hour

1–2h

2h+

Are rehearsals held in a location that is easily accessible by public transportation?

Y  N

Since Covid, the singing group:

No longer meets

Meets in a different way (i.e. virtually, over the phone). Please describe: \_\_\_\_\_

Has the choir leader received any specialised training specifically linked to supporting the health and wellbeing of this target population? (e.g. training in music therapy, group facilitation, health and wellbeing)  Y  N  N/A

If yes, please describe: \_\_\_\_\_

Is there a fee to join this group?  Y  N

If yes, what is the approximate annual cost? \_\_\_\_\_

### RECRUITMENT

How have group members learned about this opportunity? (please select all that apply)

Referral from healthcare professional (i.e. social prescription, GP, mental health professional)

Referral from community link worker (i.e. social prescribing coordinator, community health worker, community volunteer)

Independently sought out choir

Word of mouth

Other (please describe): \_\_\_\_\_

### PERFORMANCE

Does the singing group perform to an audience?

Weekly

Monthly

Between two and four times a year

Once a year

Never

## Group singing for health and wellbeing in the Republic of Ireland: the first national map

**Choir aims**

**Please note with an 'X' whether you agree or disagree that the aims listed below are priorities for this particular group, and rank in order highest (1) to lowest (7) priority.**

Aim	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
A professional level of artistic production					
Singers' general wellbeing					
Singers' health					
Socialisation of singers (making friends and building relationships)					
Social integration (singers of different generations or cultural background)					
Singing for pleasure/leisure					
Producing public concerts					
Other (please explain below)*					

\*Other priorities \_\_\_\_\_

What are the key ingredients that make this singing group successful? \_\_\_\_\_

What is one sentence that really gets to the core of how this programme prioritises the health and wellbeing of its participants?  
\_\_\_\_\_

Has the programme been evaluated in some capacity? \_\_Y\_\_N

Is there anything else you would like to add? \_\_\_\_\_

Name of individual completing survey: \_\_\_\_\_

Contact email: \_\_\_\_\_ Contact phone number: \_\_\_\_\_

Would you be willing to participate in a short conversation to follow-up on this survey? \_\_Y\_\_N

Would you like to receive a summary of the results of the study? \_\_Y\_\_N

**LOCAL RESOURCES**

We are aiming to compile a list of singing resources around the country. Are the details you listed previously the details you would like us to use?

\_\_Y\_\_N \_\_If no, please enter details here: \_\_\_\_\_

## Group singing for health and wellbeing in the Republic of Ireland: the first national map

## APPENDIX 2

List of non-clinical, clinical and individual populations	
	<i>n</i>
Clinical and Individual Populations	
Workplace Choirs	
Hospital staff – current and retired	3
Hospital staff	2
Hospital staff – current, retired and family	1
HSE Staff	3
Dun Laoghaire Rathdown County Council current and retired staff	2
HSE Staff – current and retired	1
HSE and Tusla staff	1
Staff, service users and family/friends of people within the mental health sector of HSE, Mid West	1
Children's Health Ireland Staff	1
Cork Prison Male Staff	1
Galway Mayo Institute of Technology Staff	1
Westmeath County Council Staff	1
Medtronics – current and retired staff	1
Volunteers supporting individuals with mental health condition	1
Volunteers in the community, community members	1
Older Adults	
Retirees	5
Aged 55 and older, community members with dementia and their carers	2
Aged 50 and older	1
Aged 55 and older	1
Older adults using a particular day centre and/or living in a residential unit	1
Senior citizens	1
Primarily older adults in the community	1
Individuals Affected by Illness or Injury	
Individuals affected by cancer	2
Individuals with Parkinson's Disease and their carers/family/friends	2
Individuals with a mental health condition	2

## Group singing for health and wellbeing in the Republic of Ireland: the first national map

## APPENDIX 2 (continued)

	<i>n</i>
People with COPD or other chronic lung disease	1
Individuals affected by stroke	1
Individuals with an acquired brain injury	1
Family carers	1
Adults with physical disabilities	2
Adults with intellectual disabilities and Transition Year Students	1
Intergenerational	2
General health and wellbeing for adults	1
Marginalised Community	1
people availing of a Galway Simon Project service/affected by the trauma of homelessness	1
New migrants to Ireland	1
Individuals in specific circumstances e.g. recovering from mental health, addiction, facing difficulties – as outlined by The Lantern Project	1
Residents of the Tullow Road area of Carlow Town	1
Non-Clinical	
Gender	
Men	5
Members of Ballina Men's Shed	1
Women	4
Women from different nationalities	1
Young People/students	12
Adults 18+	5
Adults 16+	1
Students and alumni of Galway Mayo Institute of Technology	1
Professional singers	1
Irish speakers	1
Ukulele players who sing	1
Missing	1

## Group singing for health and wellbeing in the Republic of Ireland: the first national map

## APPENDIX 3

Relevant health and wellbeing professions and trainings		
Profession	Music Therapist	13
	Community Musician	5
	Music Teacher	4
	Professional Musician	3
	Arts and Health Professional	2
	Works at a university	2
	Academic, Arts Organisation Professional, Arts Practitioner Researcher, Community Development, Community Musician/Music Therapist, Counselling, Medical Doctor, Mental Health Professional, Occupational Therapist, Psychotherapist, Rehabilitation Officers/ Social care, background in music, Social Therapist, Speech and Drama Teacher/background in music, Speech and Language Therapist, Stroke Support Group Coordinators	1
Educational Background		
Obtained or Pursuing Diploma or Certificate	Certificate in Music Therapy	2
	Adult Training and Development, Community and group music teaching, Community Music, Homoeopathy, Certificate in Music Therapy	1
Bachelor's Degree	Music	3
	Psychology, Training and Education, Unspecified	1
Obtained or pursuing postgraduate Degree	Arts, Chaplaincy, Choral Studies, MA in Vocal Pedagogy in Singing for health and wellbeing, Music, Music Education, Theology	1
Trainings	Experience in Choral Conducting	4
	Dementia Training	2
	Group Facilitation	2
	Health and wellbeing	2
	Music Network Training	2
	MusicAlive	2
	Musicians Without Borders training	2
	Natural Voice Network	2
	CALM–Music and Health musicians training, Choral Workshops, Estill voice training, Holistic Wellness Tutor, Kid's Classics music in healthcare training, Kodály music education method, Meditation, Mindfulness, Purple House Cancer Support Training, Sing to Beat Parkinson's, Singing for Lung Health, Singing for Parkinson's, Singing for the Brain, Social & Health Education Project Trainings, Cork, Sound & Music for Healing and Personal Development, Trauma-informed music facilitation, Vocal Health Education, Vocal Health First Aid, Wellbeing	1



# Longitudinal changes in home-based arts engagement during and following the first national lockdown due to the COVID-19 pandemic in the UK

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## Keywords

arts engagement; COVID-19; lockdown; longitudinal; trend; growth trajectory

## Abstract

**Aims:** This study aimed to examine potential heterogeneity in longitudinal changes in home-based arts engagement during the first national lockdown and following gradual easing of restrictions in the UK. Furthermore, it sought to explore factors that were associated with patterns of longitudinal changes in home-based arts engagement.

**Method:** Data were from the UCL COVID-19 Social Study. The analytical sample consisted of 29,147 adults in the UK who were followed up for 22 weeks from 21 March to 21 August 2020. Data were analysed using growth mixture models.

**Results:** Our analyses identified five classes of growth trajectories. There were two stable classes showing little change in arts engagement over time (64.4% in total), two classes showing initial increases in arts engagement followed by declines as restrictions were eased (29.8%), and one class showing slight declines during strict lockdown followed by an increase in arts engagement after the easing of restrictions (5.9%). A range of factors were found to be associated with class membership of these arts engagement trajectories, such as age, gender, education, income, employment status, and health.

**Conclusion:** There is substantial heterogeneity in longitudinal changes in home-based arts engagement. For participants whose engagement changed over time, growth trajectories of arts engagement were related to changes in lockdown measures. These findings suggest that some individuals may have drawn on the arts when they needed them the most, such as during the strict lockdown period, even if they usually had lower levels of arts engagement before the pandemic. Overall, our results indicate the importance of promoting arts engagement during pandemics and periods of lockdown as part of public health campaigns.

## INTRODUCTION

Over the last two decades, there has been growing evidence that arts engagement (engaging with any form of arts and cultural activities) contributes to the promotion of health and wellbeing, prevention of mental and physical illness, and management of existing health conditions.<sup>1,2</sup> Recent evidence shows that the arts have played an important role in supporting health and wellbeing specifically during the COVID-19 pandemic.<sup>3-5</sup> However, the ways that

people engage in the arts – their patterns of cultural consumption – have been substantially affected by the pandemic. On one hand, the introduction of lockdown and ‘stay-at-home’ orders led to the closure of public spaces, galleries, museums, arts venues, and other cultural assets. On the other hand, the pandemic provided new opportunities to engage in the arts at home through both increased digital availability of the arts (e.g. virtual choirs and online arts classes) and the introduction of furlough

schemes, whereby large proportions of the population were required to take leave from work. For example, in the first UK lockdown, the online sales of a large arts and crafts retailer increased by 200%.<sup>6</sup> Additionally, 22% of people reported spending more time on home-based arts activities during the first UK lockdown, and 52% of these people maintained or increased these levels of arts engagement 3 months later.<sup>7</sup>

While there appears to have been an overall increase in arts engagement during initial COVID-19 lockdowns, engagement and its changes may differ across individuals with different characteristics.<sup>5,7</sup> Prepandemic studies have repeatedly found that arts engagement is higher among younger adults, women, people living in rural areas, those with higher educational levels, individuals with greater social support, and people with better physical and mental health.<sup>8–12</sup> Many of these groups have also made greatest use of the arts during the COVID-19 pandemic.<sup>7</sup> However, there is some evidence that other factors such as ethnicity, partnership status, socio-economic position, and mental/physical health conditions were differentially associated with arts engagement prior to and during the COVID-19 pandemic.<sup>7</sup> For example, ethnicity was not associated with arts engagement during the first UK lockdown,<sup>7</sup> despite previous evidence that people from an ethnic minority background engaged in the arts less prior to the pandemic.<sup>9,10</sup> Also in contrast to previous findings, people with higher levels of loneliness and diagnosed mental health conditions had higher engagement levels.<sup>7</sup> This suggests that the demographic, socio-economic, and health profiles of arts audiences might have changed during the pandemic.

However, several questions remain unanswered. To date, research has focused on average levels of arts engagement during COVID-19, conflating the nuanced experiences of different subgroups and how these experiences might have evolved longitudinally. It is also unclear whether the different stages of lockdown, such as the easing of restrictions, led to changes in arts engagement. Understanding the

longitudinal patterns of arts engagement during the pandemic, and factors associated with these patterns, is crucial for understanding how and when individuals use the arts to support their health and wellbeing. It is also important for the arts sector to understand how the pandemic affected patterns of arts engagement. Identifying whether any changes in engagement were temporary, while social restrictions were most stringent, or have persisted following the easing of restrictions may show whether audiences for home-based arts activities have changed. This could guide strategies for arts funding and broader cultural policies to re-establish the arts sector to provide sufficient resources and opportunities for the public as the pandemic continues and abates, which has important public health implications.<sup>13</sup>

In light of this, the present study aimed to examine how home-based arts engagement changed during the COVID-19 pandemic in the UK. First, we investigated potential heterogeneity in longitudinal changes in arts engagement, using a large sample of 29,147 adults followed across 22 weeks from 21 March to 21 August 2020, a period that spanned the first UK lockdown and the easing of restrictions. Second, we explored whether a range of factors were associated with different patterns of longitudinal changes in arts engagement.

## METHODS

### Sample

We analysed data from the UK COVID-19 Social Study run by University College London; a longitudinal study that focuses on the psychological and social experiences of adults living in the UK during the COVID-19 pandemic. The study commenced on 21 March 2020 and involves weekly and then monthly online data collection from participants for the duration of the pandemic. The study did not use a random sample design and therefore the original sample is not representative of the UK adult population. However, it does contain a heterogeneous sample that was recruited using three primary approaches. First, convenience sampling was used, including promoting the study through existing networks and

mailing lists (including large databases of adults who had previously consented to be involved in health research across the UK), print and digital media coverage, and social media. Second, more targeted recruitment was undertaken focusing on (1) individuals from a low-income background, (2) individuals with no or few educational qualifications, and (3) individuals who were unemployed. Third, the study was promoted via partnerships with third sector organisations to vulnerable groups, including adults with mental health conditions, older adults, carers, and people experiencing domestic violence or abuse. A full protocol for the study is available online at <https://osf.io/jm8ra/>.

We included participants who had at least three repeated measures between 21 March and 21 August 2020 when the study switched from weekly to monthly follow-up and the relevant measure was discontinued (49,846 participants). Around 10% of these participants withheld data or preferred not to report on demographic and health-related factors and were therefore excluded from our analysis. Furthermore, we excluded participants (32%) with missing data on comparative arts engagement (during versus prepandemic). This provided us a final analytic sample size of 29,147 participants, followed-up for a maximum of 22 weeks. See the Supplementary Material for an overview of the UK COVID-19 restrictions during this period.

### Measures

Arts engagement was measured by a single-item question asking how long participants had spent 'engaging in a home-based arts or crafts activity (e.g., painting, creative writing, sewing, playing music, etc)' on the last working weekday. Asking about the last working weekday aimed to encourage specificity of recall, following the 'time diary' approach, and remove variation from those who took part on weekends.<sup>14</sup> Weekly responses were recorded on a 5-point frequency scale (did not do, <30 min, 30 min–2 h, 3–5 h, ≥6 h). Given the low frequency of arts engagement, we created a binary variable indicating whether participants spent any time on arts or crafts activities during the last working weekday (yes versus no).

A range of socio-demographic and health-related factors measured at baseline were considered as predictors of arts engagement trajectories. These included gender (women versus men), ethnicity (white versus ethnic minorities), age (18–29, 30–45, 46–59, 60+ years), education (GCSE levels or below, A-levels or equivalent, degree or above), household income (<£16,000, £16,000–29,000, £30,000–59,000, £60,000–89,000, ≥£90,000 per annum), employment status (employed throughout, employed at baseline but lost job during the follow-up, unemployed, or economically inactive), living arrangement (living alone, living with others but no children, living with others including children), and area of living (city, large town, small town, rural). Health-related factors were self-reported disability (yes versus no) and self-reported diagnosis of any mental health condition (yes versus no). We also included a comparative measure of arts engagement, in which participants were asked: ‘how does this [their current arts engagement] compare to your usual arts engagement not in lockdown?’ Responses were recorded in three categories: less than usual, about the same, and more than usual. The original questionnaire is available online at <https://osf.io/jm8ra/>.

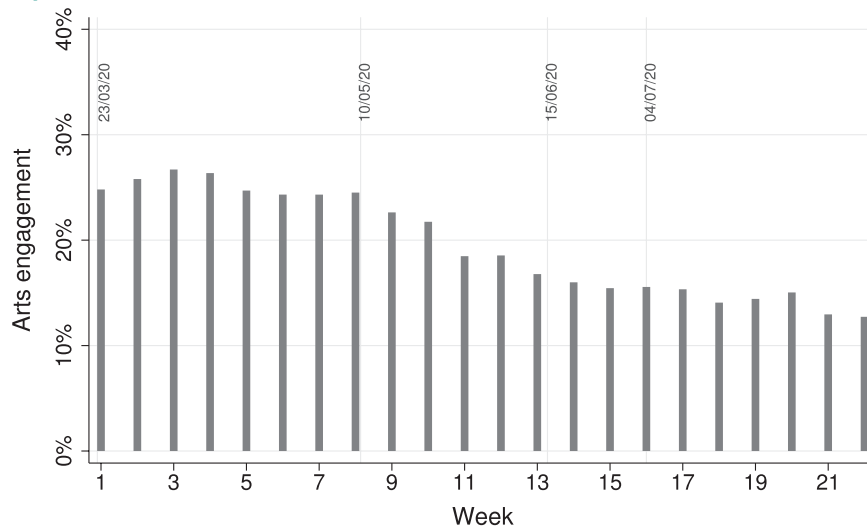
### Statistical analysis

Data were analysed using the growth mixture modelling (GMM) approach. The conventional growth modelling approach specifies one homogeneous growth trajectory, allowing individual growth factors to vary randomly around the overall mean. GMM relaxes this assumption and enables researchers to explore different patterns of longitudinal changes (latent trajectory classes<sup>15</sup>).

Starting with the unconditional GMM, we compared models with different number of classes using the Bayesian information criterion (BIC), sample-size adjusted Bayesian information criterion (ABIC), Vuong-Lo-Mendell-Rubin likelihood ratio (LMR-LR) test, and adjusted Lo-Mendell-Rubin likelihood ratio (ALMR-LR) test. We included quadratic and cubic functions of time scores to allow for nonlinear polynomial changes. After identifying the optimal

Figure 1

**Percentage of participants who engaged in home-based arts activities across 22 weeks** Notes: On March 23, the first lockdown commenced in the UK. On May 10, it was announced that strict lockdown was being eased. On June 15, non-essential retail was reopened. On July 4, further public amenities were reopened



number of classes, we introduced predictors to explain the observed heterogeneity between classes.

Weights were applied throughout the analyses. The final analytical samples were weighted to the proportions of gender, age, ethnicity, education, and country of living obtained from the Office for National Statistics.<sup>16</sup> The descriptive analyses were implemented in Stata v16 and GMM in Mplus Version 8.

### RESULTS

Before weighting the 29,147 participants, there was an over-representation of women and people with a degree or above and under-representation of people from ethnic minority backgrounds and adults under 30 (Table 1). After weighting, the sample reflected population proportions, with 50.6% women, 33.4% with a degree or above, 12.8% of ethnic minority, and 19.5% under 30. Figure 1 shows the percentage of participants who spent time on arts activities over the 22-week follow-up.

#### Latent trajectory classes

To determine the optimal number of latent trajectory classes, we compared across unconditional GMMs with different

numbers of classes. Although the BIC and ABIC continued to decrease with each additional class being added to the model, the ALMR-LR test of the six-class GMM did not reject the five-class model (Table S1). Therefore, the five-class GMM model was chosen. It had an adequate quality of class membership classification (entropy=0.82). Figure 2 shows the estimated probability of home-based arts engagement longitudinally in each latent class (LC) based on the unconditional five-class GMM.

The first and largest latent class (LC1; ‘disengaged’; 56.5% of the sample) had a very low probability of home-based arts engagement, with little change observed over the 22-week period. In contrast, LC2 (‘highly engaged’; 7.9%) included people with consistently high probabilities of arts engagement throughout the study period. The last three classes (LC3–5) were dynamic, showing substantial changes during follow-up. LC3 (‘highly engaged decreasing’; 9.5%) showed an increase in the probability of home-based arts engagement in the first few weeks of lockdown, which was followed by a rapid decline as lockdown measures were eased. LC4 (‘moderately engaged decreasing’; 20.3%) started from a

Table 1

<b>Descriptive statistics of the sample (N=29,147).</b>				
	<b>Raw data</b>		<b>Weighted data</b>	
	<b>%</b>	<b>N</b>	<b>%</b>	<b>N</b>
<b>Gender</b>				
Women	74.6	21,735	50.6	14,749
Men	25.4	7412	49.4	14,398
<b>Ethnicity</b>				
Minority	3.9	1136	12.8	3731
White	96.1	28,011	87.2	25,416
<b>Age</b>				
18–29	5.6	1635	19.5	5684
30–45	24.2	7052	26.1	7607
46–59	32.4	9454	24.1	7024
60+	37.8	11,006	30.3	8832
<b>Education</b>				
Low (GCSEs or below)	12.9	3774	32.7	9531
Medium (A-levels or equivalent)	16.7	4868	33.9	9880
High (degree or above)	70.4	20,505	33.4	9736
<b>Household income (annual)</b>				
<16k	14.4	4198	19.2	5587
16–29k	25.1	7309	27.8	8105
30–59k	35.3	10,294	33.0	9619
60–89k	14.9	4342	12.2	3566
≥90k	10.3	3004	7.8	2270
<b>Employment status</b>				
Employed	50.5	14,728	46.6	13,594
Employed to unemployed	10.1	2955	10.6	3076
Unemployed/economically inactive	39.3	11,464	42.8	12,477
<b>Living status</b>				
Living alone	21.8	6366	19.0	5550
Living with others (not children)	55.5	16,171	57.3	16,707
Living with others (including children)	22.7	6610	23.6	6890

*(Continued)*

moderate probability of engaging during lockdown, which then declined sharply as lockdown measures eased, before stabilising at a very low level of engagement. Finally, LC5 ('moderately engaged increasing'; 5.9%) was the only class that showed an overall increase in arts engagement over time. In LC5, probability of arts engagement decreased slightly in the first few weeks of lockdown, steadily increased as lockdown eased, and then decreased again in the last few weeks of the study period.

### Factors associated with latent trajectory classes

We fitted a conditional GMM to examine how individual characteristics were related to the latent classes of longitudinal changes in home-based arts engagement (Table 2). Using LC1 ('disengaged') as the reference class, the odds of being consistently highly engaged (LC2) for women were more than threefold that for men. Compared with young adults (under 30), people aged 60+ had higher odds of being in LC2. People with a degree or above had higher odds of being in LC2 than those with GCSEs or below. Compared with people who were employed, those who lost their job during the follow-up had higher odds of being in LC2. Those who were already unemployed or economically inactive at the start of lockdown had even higher odds of being in LC2. Compared with people living alone, those living with children had higher odds of being in LC2. Additionally, people with a disability or mental health diagnosis were more likely to be in LC2 than LC1. Finally, people who reported changes in their arts engagement frequency compared to before the pandemic were more likely to be in LC2 than individuals who maintained similar engagement levels.

Relative to LC1 ('disengaged'), women were more likely to be in LC3 ('highly engaged decreasing') and LC4 ('moderately engaged decreasing'). People aged 30–45 had lower odds of being in LC3 or LC4 compared to young adults, and those aged 46–59 had lower odds of being in LC4. There was no difference between young (under 30) and older adults (60+). People with a higher

Table 1 (Continued)

**Descriptive statistics of the sample (N=29,147).**

	Raw data		Weighted data	
	%	N	%	N
<b>Area of living</b>				
City	32.8	9571	34.3	10,011
Large town	17.5	5096	20.6	6011
Small town	25.3	7373	24.9	7257
Rural area	24.4	7107	20.1	5868
<b>Disability</b>				
Yes	7.8	2279	9.4	2748
No	92.2	26,868	90.6	26,399
<b>Mental health diagnosis</b>				
Yes	16.8	4907	20.1	5856
No	83.2	24,240	79.9	23,291
<b>Arts engagement</b>				
Less than usual	17.8	5197	15.9	4641
About the same	56.7	16,524	61.2	17,851
More than usual	25.5	7426	22.8	6655

level of education had higher odds of being in LC3. Membership of LC3 and LC4 compared to LC1 was also related to household income. People with a household income of ≥£60,000 were less likely to be in LC3 and those with a household income of ≥£90,000 were less likely to be in LC4. Compared to the employed, people who lost their job during the pandemic had higher odds of being in LC3 or LC4, and those who were unemployed or economically inactive at the start of lockdown had higher odds of being in LC3. Compared to people living alone, those who lived with other adults had higher odds of being in LC3, whereas people living with children were more likely to be in LC3 or LC4. People with a disability had higher odds of being in LC4. People with mental health diagnoses had higher odds of being in LC3. Finally, people whose arts engagement frequency changed compared to before the pandemic were more likely to be in LC3 or LC4 than individuals who maintained similar engagement levels.

Compared to LC1 ('disengaged'), women were more likely to be in LC5 ('moderately engaged increasing'). Adults aged 46–59 had lower odds of being in LC5 than young adults. People with a

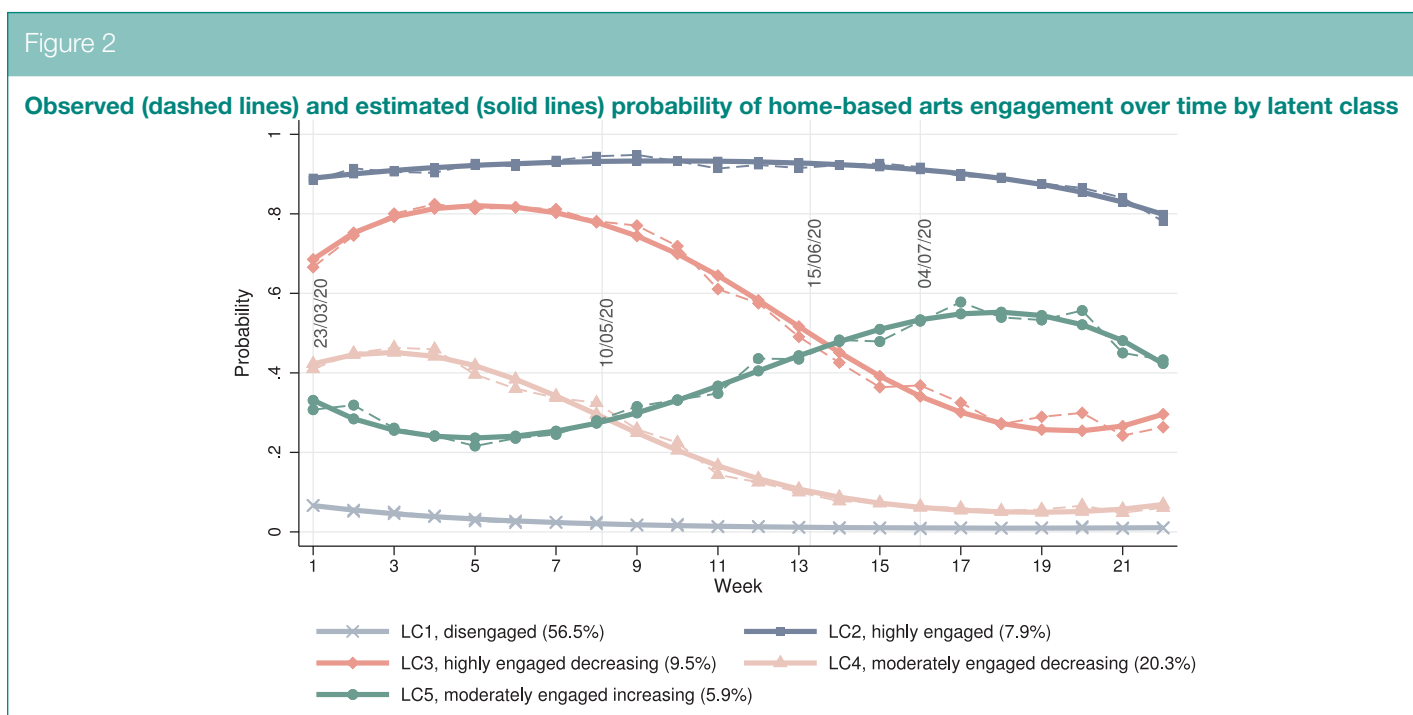


Table 2

**Results from the growth mixture model with predictors of latent classes (LC) (LC1, the disengaged, as the reference, N=29,147)**

	Highly engaged LC2 (versus LC1)		Highly engaged decreasing LC3 (versus LC1)		Moderately engaged decreasing LC4 (versus LC1)		Moderately engaged increasing LC5 (versus LC1)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Woman (versus man)	<b>3.09</b>	<b>[2.37–4.03]</b>	<b>3.46</b>	<b>[2.54–4.71]</b>	<b>2.36</b>	<b>[1.98–2.80]</b>	<b>2.57</b>	<b>[1.91–3.47]</b>
Ethnic minority (versus white)	0.92	[0.56–1.51]	1.48	[0.92–2.36]	1.10	[0.77–1.58]	1.24	[0.75–2.07]
Age 30–45 (versus 18–29)	1.02	[0.66–1.58]	<b>0.67</b>	<b>[0.46–0.98]</b>	<b>0.67</b>	<b>[0.49–0.91]</b>	0.74	[0.47–1.16]
Age 46–59 (versus 18–29)	1.29	[0.85–1.95]	0.73	[0.47–1.11]	<b>0.59</b>	<b>[0.43–0.80]</b>	<b>0.65</b>	<b>[0.43–0.99]</b>
Age 60+ (versus 18–29)	<b>1.87</b>	<b>[1.20–2.91]</b>	0.99	[0.65–1.52]	0.79	[0.58–1.08]	0.69	[0.44–1.09]
Education medium (versus low)	1.14	[0.87–1.49]	<b>1.61</b>	<b>[1.18–2.19]</b>	1.07	[0.85–1.35]	1.13	[0.78–1.63]
Education high (versus low)	<b>1.33</b>	<b>[1.01–1.75]</b>	<b>1.56</b>	<b>[1.17–2.10]</b>	1.15	[0.92–1.43]	<b>1.45</b>	<b>[1.03–2.04]</b>
Household income 16–29k (versus <16k)	1.11	[0.84–1.46]	0.87	[0.63–1.19]	1.01	[0.79–1.28]	0.80	[0.56–1.14]
Household income 30–59k (versus <16k)	0.75	[0.55–1.02]	0.79	[0.56–1.11]	0.98	[0.75–1.26]	<b>0.46</b>	<b>[0.31–0.68]</b>
Household income 60–89k (versus <16k)	0.86	[0.54–1.36]	<b>0.60</b>	<b>[0.38–0.95]</b>	0.95	[0.67–1.36]	<b>0.48</b>	<b>[0.29–0.79]</b>
Household income ≥90k (versus <16k)	0.67	[0.41–1.10]	<b>0.53</b>	<b>[0.32–0.89]</b>	<b>0.61</b>	<b>[0.42–0.89]</b>	<b>0.45</b>	<b>[0.22–0.93]</b>
Employed to unemployed (versus employed)	<b>1.51</b>	<b>[1.10–2.08]</b>	<b>1.89</b>	<b>[1.42–2.51]</b>	<b>1.54</b>	<b>[1.19–1.99]</b>	1.16	[0.76–1.78]
Unemployed/inactive (versus employed)	<b>2.18</b>	<b>[1.69–2.80]</b>	<b>1.62</b>	<b>[1.22–2.15]</b>	1.09	[0.88–1.36]	1.39	[1.00–1.92]
Living with others, but no children (versus alone)	1.20	[0.96–1.50]	<b>1.39</b>	<b>[1.08–1.79]</b>	1.11	[0.91–1.35]	<b>1.38</b>	<b>[1.01–1.90]</b>
Living with others, including children (versus alone)	<b>1.70</b>	<b>[1.19–2.43]</b>	<b>2.38</b>	<b>[1.76–3.21]</b>	<b>2.19</b>	<b>[1.69–2.83]</b>	1.56	[0.93–2.61]
Large town (versus city)	0.79	[0.58–1.06]	0.88	[0.63–1.23]	0.94	[0.76–1.17]	0.66	[0.43–1.00]
Small town (versus city)	0.86	[0.67–1.10]	1.30	[0.89–1.89]	1.22	[0.96–1.56]	0.89	[0.61–1.31]
Rural (versus city)	0.82	[0.62–1.07]	1.06	[0.80–1.40]	1.22	[0.99–1.51]	0.89	[0.65–1.22]
Disability (versus no disability)	<b>1.78</b>	<b>[1.30–2.44]</b>	1.37	[0.81–2.29]	<b>1.84</b>	<b>[1.40–2.42]</b>	1.13	[0.71–1.82]
Mental health diagnosis (versus no diagnosis)	<b>1.43</b>	<b>[1.10–1.86]</b>	<b>1.68</b>	<b>[1.27–2.22]</b>	1.17	[0.95–1.45]	1.38	[0.98–1.93]
Less arts engagement than usual (versus the same)	<b>1.38</b>	<b>[1.02–1.87]</b>	<b>1.60</b>	<b>[1.16–2.19]</b>	<b>1.58</b>	<b>[1.28–1.94]</b>	<b>2.05</b>	<b>[1.46–2.87]</b>
More arts engagement than usual (versus the same)	<b>7.39</b>	<b>[5.88–9.30]</b>	<b>6.18</b>	<b>[4.87–7.84]</b>	<b>3.34</b>	<b>[2.75–4.05]</b>	<b>3.66</b>	<b>[2.40–5.57]</b>

OR: odds ratio; CI: confidence interval.  
95% CI not including 1 in bold text.

degree or above had higher odds of being in LC5 than those with the lowest education levels. People with a household income of  $\geq$ £30,000 were less likely to be in LC5 than those with a household income under £16,000. Compared with people living alone, those who lived with other adults had higher odds of being in LC5. Finally, people whose arts engagement frequency changed compared to before the pandemic were more likely to be in LC5 than individuals who maintained similar engagement levels.

Next, in sensitivity analyses, we altered the reference categories (Table S2). When comparing the two classes with a high probability of arts engagement at the start (LC3 'highly engaged decreasing' versus LC2 'highly engaged'), the only predictor of class membership was age. People aged 46 and over were less likely to be in LC3, indicating that they were less likely to reduce their arts engagement than young adults. Comparing the classes that started with a moderate level of arts engagement (LC5 'moderately engaged increasing' versus LC4 'moderately engaged decreasing'), people with a household income of £30,000–£89,000 were less likely to be in LC5, indicating that they were less likely to increase their engagement than individuals with the lowest income.

## DISCUSSION

This was one of the first studies to examine patterns of longitudinal changes in home-based arts engagement during the COVID-19 pandemic, specifically exploring differences across the first UK lockdown and the easing of lockdown measures. Our analyses identified five unique classes of longitudinal changes in arts engagement. Two of these classes were stable, showing few changes as social restrictions were enforced and relaxed, including the consistently disengaged (56.5% of participants) and the consistently highly engaged (7.9%). Two classes (29.8%) showed initial increases in arts engagement during the first lockdown, followed by declines as restrictions were eased. Only one small class (5.9%) showed the opposite

pattern of declines during lockdown followed by an increase as restrictions were lifted. These longitudinal changes in arts engagement are more nuanced than previously indicated by self-reported comparative measures of arts engagement.<sup>7</sup> We found clear changes that coincided with the easing of restrictions, suggesting that people's motivations to engage could be directly related to policy changes.

This study further examined whether a range of factors were associated with the patterns of changes in home-based arts engagement during the pandemic. Some factors were consistently associated with patterns of engagement, in line with previous research. Women, those with higher levels of education, and those living with others were more likely to be in any group except the 'disengaged', as found both before and during the COVID-19 pandemic.<sup>7,8,10</sup> There was no evidence that ethnicity was associated with longitudinal patterns of home-based arts engagement. Prepandemic research has found that, when broadly defined, arts engagement differs by ethnicity.<sup>9,10</sup> However, ethnic disparities may be larger in receptive cultural activities than in home-based arts activities.<sup>7,17</sup> It is thus not surprising that home-based arts engagement did not differ according to ethnicity.

However, some findings were less consistent. The odds of constantly high engagement increased with age and some older age groups were less likely to have increasing or decreasing engagement than young adults. This suggests that older adults had higher and more stable levels of arts engagement. In previous studies, younger people generally engage in the arts more often.<sup>7,18</sup> This inconsistency might be due to the strict lockdown measures for older adults, who were strongly advised to stay at home even after lockdown measures were relaxed for other age groups in the UK. Additional time at home might have increased opportunities and motivations for older adults to engage in arts activities to help sustain their wellbeing. Lockdown may also have caused fewer differences to normal life for retired individuals, leading to more consistent patterns of leisure engagement.<sup>19</sup> Younger adults might have spent more time engaging in

other activities, including using social media, playing video games, and meeting others after lockdown measures were eased. Despite this, young people were more likely to have engaged in the arts than adults aged 30–59. This working age group may have faced challenges around childcare while working, reducing time available for leisure.<sup>20,21</sup>

The association between household income and arts engagement may also have been altered by the pandemic. Prepandemic studies have generally demonstrated more arts engagement with increasing income.<sup>17,22</sup> However, as in two recent studies,<sup>7,18</sup> we found that individuals with a lower household income were less likely to be in the 'disengaged' group. People with lower income were also more likely to have increased arts engagement throughout the first 22 weeks of the pandemic. This may be because lower-paying jobs were more severely disrupted by the pandemic, with individuals in these roles likely to be working fewer hours,<sup>23</sup> leaving more free time for arts engagement. However, those who were employed for the whole period were more likely to be consistently disengaged, so any form of job could still reduce time available to engage in arts activities.

People living with others were also more likely to engage in the arts. In particular, those living with children maintained high levels of engagement, although these individuals were also likely to start with high levels of engagement that declined over time. These findings are supported by the increased sales in arts and crafts supplies when schools and recreational facilities were closed.<sup>5,6</sup> Arts activities might have offered new opportunities for parents to engage with their children, as well as preventing boredom at home.<sup>5</sup> Some of these activities were publicly visible, such as the proliferation of rainbow drawings among families in the UK to support frontline health professionals and key workers and to spread hope.<sup>24,25</sup> It is possible that individuals living with children had decreasing levels of arts engagement throughout the pandemic due to burnout and difficulties in sustaining a balance between work, childcare, schooling, and other responsibilities.<sup>20,21</sup> While previous studies have shown that people living in

remote areas are more likely to engage in the arts,<sup>7,26</sup> we found no associations between living area and longitudinal patterns of arts engagement. This suggests that changes over time might not vary by level of urbanicity.

Finally, people with a disability or mental health diagnosis were more likely to be highly engaged in arts activities throughout the first 22 weeks of the pandemic. In contrast, prepandemic studies suggest that people with physical health conditions, lower wellbeing, and those who are less happy have lower engagement levels.<sup>10,27,28</sup> This could be due to the transition of the cultural sector to providing more opportunities for engagement online, reaching wider audiences, reducing barriers to accessing the arts, and creating new opportunities to participate, especially for people who have traditionally engaged less in the arts.<sup>7</sup> In addition to this greater accessibility, people with a health condition might have used arts more frequently to help manage their emotions during the pandemic.<sup>7,29</sup>

This study has a number of strengths including its large sample size, repeated weekly follow-up of the same participants over 22 weeks since the first UK lockdown, and robust statistical approaches. Although the UCL COVID-19 Social Study did not use a random sample, it does have a large sample size with wide heterogeneity, including good stratification across all major socio-demographic groups. In addition, analyses were weighted using population estimates of core demographics. The weighted data aligned well with national population statistics and another large nationally representative social survey.<sup>30</sup> Despite all efforts to make our sample inclusive and representative of the adult population in the UK, we cannot rule out the possibility of potential biases due to omitting other demographic factors that could be associated with survey participation in the weighting process. Furthermore, our arts engagement measure focused on one weekday which might obscure possible patterns of arts engagement during weekends, especially for those who are employed. Finally, this study only investigated home-based engagement, in particular arts or crafts activities, as opportunities for arts

engagement outside of the home were largely suspended. We recognise that other types of arts engagement activities may exhibit a different trend over time. For instance, an analysis of Spotify's streaming data in 60 countries has showed a notable reduction in music streaming during the COVID-19 outbreak,<sup>31</sup> in contrast to the surge in arts and crafts sales.<sup>6</sup> Therefore, future studies could extend our analyses by including other types of home-based arts engagement activities (e.g. listening to music, streaming a concert) or non-home-based arts activities (e.g. going to a theatre or museum). Future studies are also needed to extend the follow-up period to explore long-term patterns of arts engagement during and beyond the COVID-19 pandemic.

## CONCLUSION

Overall, this study provides evidence for heterogeneity in longitudinal changes in home-based arts engagement during the COVID-19 pandemic, showing five unique patterns. Only a small proportion of participants were consistently engaged in home-based arts activities. Instead, over half of the samples were consistently disengaged, and nearly a third had good levels of engagement during the first lockdown that declined as soon as lockdown eased and other activities within society resumed. Patterns of engagement could be related to changes in social restrictions, with individuals drawing on the arts when they needed them the most. Some characteristics of the audience for home-based arts activities, such as gender and education, were consistent with usual audiences for such activities. However, other groups who are usually less likely to engage in the arts, such as people with mental health conditions, engaged more during the pandemic. This is encouraging as it suggests that those who needed the arts most did indeed engage more. It also indicates audience diversification, with potential implications for the future of the cultural sector. If audiences who have traditionally been harder to reach can be engaged in times of crisis, it may be possible to encourage greater participation from them for public health benefits beyond the pandemic. However, as the majority of

participants reverted to lower levels of engagement when restrictions eased, the effects of lockdown on arts engagement may be largely transient. Overall, these results show the importance of promoting arts engagement during pandemics as part of public health campaigns, especially when social restrictions are introduced. The engagement patterns identified suggest that even groups less likely to engage in usual circumstances have increased odds of engaging in the arts during a pandemic. Given the critical role of the arts as coping strategies, this has important ramifications for supporting public mental health. However, if the cultural sector wants to sustain changes in audiences brought about by the COVID-19 pandemic, more work is needed to re-engage those groups who have since reverted to lower levels of engagement.

## AUTHOR CONTRIBUTIONS

F.B. and D.F. conceived and designed the study. F.B. analysed the data. H.W.M., F.B., and J.K.B. wrote the first draft. All authors provided critical revisions. All authors read and approved the submitted manuscript.

## CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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## ETHICS

The study was approved by the UCL Research Ethics Committee (12467/005)

and all participants gave informed consent (online).

## PPI

The research questions in the UCL COVID-19 Social Study built on patient and public involvement as part of the UKRI MARCH Mental Health Research Network, which focuses on social, cultural and community engagement and mental health. This highlighted priority research questions and measures for this study. Patients and the public were additionally involved in the recruitment of participants to the study and are actively involved in plans for the dissemination of findings from the study.

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## DATA AVAILABILITY

Anonymous data will be made publicly available following the end of the COVID pandemic.

## SUPPLEMENTAL MATERIAL

Supplemental material for this article is available online.

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