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BMJ Open

A survey to identify research priorities for primary care in Scotland following the Covid-19 pandemic

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-056817
Article Type:	Original research
Date Submitted by the Author:	01-Sep-2021
Complete List of Authors:	Hubbard, Gill; University of the Highlands and Islands, Nursing and Midwifery Grist, Fiona; University of the Highlands and Islands, nursing and midwifery Pope, Lindsey; University of Glasgow Cunningham , S ; Robert Gordon University Maxwell, Margaret; University of Stirling, Nursing, Midwifery and Allied Health Professions Research Unit Guthrie, Bruce; University of Edinburgh College of Medicine and Veterinary Medicine Mercer, Stewart; The University of Edinburgh, The Usher Institute of Population Health Sciences and Informatics
Keywords:	PRIMARY CARE, QUALITATIVE RESEARCH, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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TITLE

A survey to identify research priorities for primary care in Scotland following the Covid-19 pandemic

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ABSTRACT (290 words)

Objectives: To identify research priorities for primary care in Scotland following the Covid-19 pandemic.

Design: Modified James Lind Alliance methodology; respondents completed an on-line survey to make research suggestions and rank research themes in order of priority.

Setting: Scotland primary care

Participants: Healthcare professionals in primary care in Scotland and members of primary care Patient and Public Involvement (PPI) groups. 512 respondents provided research suggestions; 8% (n=40) did not work in health or social care; of those who did work, 68.8% worked in primary care, 16.3% community care, 11.7% secondary care, 4.5% third sector, 4.2% university (respondents could select multiple options). Of those respondents who identified as healthcare professionals, 33% were in nursing and midwifery professions, 25% were in Allied Health Professions (of whom, 45% were occupational therapists and 35% were physiotherapists), 20% were in the medical profession and 10% were in the pharmacy profession.

Main outcomes: Suggestions for research for primary care made by respondents were categorised into themes and sub-themes by researchers and ranked in order of priority by respondents.

Results: There were 1,274 research suggestions which were categorised under 12 themes and 30 sub-themes. One hundred and three (20%) respondents to the survey participated in ranking the list of 12 themes in order of research priority. The five most highly ranked research priorities were: disease and illness, health inequalities, access, workforce, and multi-disciplinary teams. The disease and illness theme had the greatest number of suggestions for research and was scored the most highly in the ranking exercise. The sub-theme ranked as the most important research priority in the 'disease and illness' theme was 'mental health'.

Conclusions: The themes and sub-themes identified in this study should inform research funders so that the direction of primary healthcare is informed by evidence.

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Strengths and limitations of this study

- This is the first comprehensive, primary care research priority setting exercise since the 2020 onset of the coronavirus pandemic.
- A transparent and systematic approach to identifying research priorities was used.
- The study included nurses, Allied Health Professionals and medical professionals and PPI group members.
- We do not know how many healthcare professionals received the survey which means that we are unable to report a response rate.
- We did not conduct a literature search to assess gaps in evidence relating to the research priorities.

Word count 3,195

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INTRODUCTION

The Covid-19 pandemic has had a significant impact on primary care[1-3] and so it is timely to set research priorities in order to support recovery. Primary care is the foundation of equitable and affordable healthcare,[4] especially in countries with universal coverage and a National Health Service (NHS) as in the United Kingdom (UK).[5] Scotland, as a devolved nation, is responsible for the funding and planning of its healthcare system with high quality primary care at the heart of its vision.[6] High quality primary care needs to be underpinned by high-quality research and evaluation.[7] Primary care is usually a person's first point of contact with the NHS[8] and it is where most patient contacts occur.[6] In this study, we adopted the following definition of primary care that has been agreed by a range of professional organisations in Scotland:

> "Primary care is provided by generalist health professionals, working together in multidisciplinary and multiagency networks across sectors, with access to the expertise of specialist colleagues. All primary care professionals work flexibly using local knowledge, clinical expertise and a continuously supportive and enabling relationship with the person to make shared decisions about their care and help them to manage their own health and wellbeing".[9]

Vertical (i.e. disease-specific) approaches to healthcare have been effective at reducing morbidity and mortality from specific conditions but have been criticized for detrimentally affecting the resources available to, and capacity of local primary care.[10] Research priorities set from a generalist and multi-professional perspective are also important and of value to patients and carers.[11-14] The high and increasing prevalence of multimorbidity associated with population ageing means that there is an increasing need for care which focusses on supporting people with multiple conditions.[15] Hence, there is a need to set both vertical (disease) and horizontal (generalist primary care) research

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priorities in order to guide research investment and direct resource allocation that will ultimately provide a robust evidence-base to underpin the development and delivery of primary care.

A number of previously published studies have identified primary care research priorities and the reach of these studies has varied with research priorities variously being developed internationally,[16] in low and middle income countries,[17] in the European Union,[18] or in single countries.[19] An argument for setting research priorities in one country, or a cluster of similar countries is because the challenges faced by primary care in different countries vary due to factors such as population characteristics (for example, an ageing population), diverse social cultures and norms, and different healthcare systems (for example, public and private healthcare systems).[18] Research priorities identified in several previous research prioritisation exercises include how primary care should be financed, organised and staffed,[16-20] the importance of implementation and translation of knowledge and evidence into primary care,[16 19] addressing multimorbidity,[16 19 20] promoting health equity,[16 19] promoting healthy behaviours in the population,[16 19] universal health coverage and health access,[16 17] digital delivery of primary care,[16 19] and the involvement of patients in the design and delivery of primary care. [16 19]

The aim of this study was to identify primary care research priorities in Scotland and set a research direction that will be relevant for patients, carers and generalist healthcare professionals in the aftermath of the coronavirus pandemic. This is the first comprehensive, generalist health professional project of primary care research priorities since the 2020 onset of the coronavirus pandemic. It is designed to strengthen future evidence for primary care to improve health outcomes.

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METHODS

This study adapted the James Lind Alliance (JLA) methodology.[21] The Steering Group for the project was the Scottish School of Primary Care (SSPC) Executive (http://www.sspc.ac.uk), which included an individual from a primary care Patient and Public Involvement (PPI) group, clinical academics and primary care researchers from Scottish universities. The following steps were taken to deliver the project:

Step 1&2: Identifying key partners and raising awareness of the study

'Key partner' organisations were identified through a process of peer knowledge and consultation, and through the Steering Group members' networks. Fifty-four key partner organisation agreed to participate by advertising the project and circulating the link to the survey to their members (Supplementary File 1: Key Partners).

Step 3: Identifying research priorities

The Steering Group administered an online survey via the key partner organisations for respondents to identify an initial set of research priorities (Supplementary File 2: Research priorities Survey). Healthcare professionals in primary care in Scotland were eligible to participate in the identification and prioritisation of research for primary care. Members of primary care PPI groups were also invited, including members of the National Research Scotland Primary Care PPI group. A period of three months was given to complete the survey (4th December 2020 – 1st March 2021). Responses were solicited with the following open-ended query that was used in a previous international JLA primary care research priorities project: "Please suggest up to three important primary care research questions" [16]. Responses were anonymous (no names were requested during the survey). Respondents were asked to provide an email if they were willing to participate in subsequent steps of the project, but these emails were stored separately from the submitted priorities. Results were downloaded from Online Survey to an Excel spreadsheet for the purposes of analysis in Step 4.

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Step 4: Analysis and identifying research themes and sub-themes

Suggestions for research by respondents were grouped into themes and sub-themes by two members of the Steering Group (GH, FG) and were grouped into themes and sub-themes by two members of the Steering Group (GH, FG), with the theoretical framework developed iteratively over several meetings including involvement of a third member of the group (SM) to resolve disagreements. Suggestions for research were allowed to be categorised under more than one theme. If a group of suggestions on the same topic totalled <1 percent (i.e. ≤12 suggestions) of the total number of research suggestions then a theme was not created. Sub-themes were identified within a theme when approximately ≥10% of suggestions were on a similar topic. Theme and sub-theme names were chosen from current policy and literature for example, sub-themes for the theme 'access' were drawn from a published definition of 'access' which included provision and availability of primary care services, equity of access, people's use of services and barriers to getting access as well as the dimension of effectiveness of using the service.[22]

Step 5: Ranking themes and research prioritisation

The aim of the final stage of the priority setting process was to rank the primary care research themes in order of priority. The respondents in Step 3 who wished to participate in this step were invited by email to rank the list of the summary research themes and sub-themes in order of priority. This exercise was done using an online survey, which was open for 1 month. Respondents were asked to rank 12 research themes that had been identified in Step 4 in order of priority, and to rank all sub-themes.

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Patient and Public Involvement and Engagement

Several meetings between GH and the National Research Scotland Primary Care Public Involvement Group were held so that patients could contribute towards developing the protocol for this study. This group was also a key partner.

Ethical approval

Independent advice was sought from NHS Grampian Research Ethics Committee and University of Highlands and Islands Research Ethics Committee, who both advised that the project did not require research ethics review because the study was identifying research priorities and not conducting the research.

RESULTS

Respondent characteristics

There were 512 respondents. Eight percent (n=40) of respondent did not work in health or social care. Of those who did work, 68.8% worked in primary care, 16.3% community care, 11.7% secondary care, 4.5% third sector, 4.2% university (respondents could select multiple options for place of work). Of those respondents who were healthcare professionals, 33% were in nursing and midwifery professions regulated by the Nursing and Midwifery Council, 25% in Allied Health Professions regulated by the Health and Care Profession Council (of whom, 45% were occupational therapists and 35% were physiotherapists), and 20% were in the medical profession regulated by the General Medical Council and 10% were in the pharmacy profession regulated by the General Pharmaceutical Council.

Research themes and sub-themes

The total number of research suggestions was 1,274. Research suggestions were categorised under 12 themes and 30 sub-themes (Table 1). The 12 themes and their associated sub-themes are

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positioned in order of the quantity of suggestions for research. Five themes had over 100 suggestions for research; these were 'disease and illness', 'access', 'workforce', 'multidisciplinary teams' and 'integration'. Hence, based on the number of suggestions for research, these are the top five priorities for research.

Table 1: Themes and associated sub-themes in order of the quantity of research suggestions that were categorised under each theme and sub-theme

Theme	Number[a]	Sub-themes	Number[a]
Disease and illness	461	Mental health	168
		Covid-19	58
		Long-term conditions	42
		Obesity	27
		Diabetes	18
		Dementia	16
		Frailty	14
		Addiction	14
Access	202	Availability and presence of services	72
		Utilisation of services and barriers	61
		Relevance & effectiveness of services	43
		Equity	26
Workforce	164	Recruitment and retention	58
		Training and development	54
		Workload	31
		Mental health	22
		GMS contract	11
Multi-disciplinary teams (MDT)	143	-	-
Integration	108	Multi-agency working & collaboration	74
		Social prescribing	20
		Continuity of care	14
Digital healthcare	96	Remote consultations	56
		Remote care	23
		IT systems	12
		Telephone triage	5
Self-care	84	Lifestyle	44
Primary / secondary care interface	62	Communication	9
		Continuity of care	9
Medications	55	-	-
Health inequalities	30	Deprivation	15
Carers	19	-	-
Patient involvement	13	Research	7
		Care	6

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a. number of research suggestions categorised under a theme and sub-theme. Not all suggestions made by respondents were categorised under a theme or sub-theme.

The theme with the most suggestions for research was 'disease and illness'; the associated sub-themes indicate multiple long-term conditions. The sub-theme with the most suggestions for research under this theme was 'mental health'. The theme with the second most suggestions for research was 'access' and included suggestions about the availability of primary care services, utilisation of these services and barriers to access, the relevance and effectiveness of these services and equity of access. 'Workforce' was the theme that had the third most suggestions for research and included suggestions about recruitment and retention of primary care staff, training and development, workload, staff mental health, and GMS Contract. 'Multi-disciplinary teams' (MDT) was the theme that contained the fourth most suggestions for research. Twenty-eight percent of suggestions did not specifically refer to a particular profession, 23% referred to nurses, 17% occupational therapists, 13% Allied Health Professions, 8% pharmacists, 4% physiotherapists and 3% psychologists. 'Integration' was the theme that had the fifth most suggestions for research; associated sub-themes were multi-agency working and collaboration, social prescribing and continuity of care. Examples of research suggestions for each theme can be found in Supplementary File 3.

Ranking of research themes and sub-themes

One hundred and three (20%) respondents to the survey (profession unknown) participated in ranking the list of 12 themes in order of research priority (Table 2). The five most highly ranked themes were as follows: 19.4% of respondents chose 'disease and illness', 17.4% chose 'health inequalities', 14.5% chose 'access', 12.6% chose 'workforce' and 12.6% chose 'multi-disciplinary team' as their number one top research priority. Hence, based on this ranking exercise, these are the top five priorities for research.

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Table 2: Themes ranked as the number one top research priority

Theme	Number of respondents ranking as top research priority
Disease and illness	20
Health inequalities	18
Access	15
Workforce	13
Multidisciplinary teams	13
Integration	6
Primary / secondary care interface	5
Digital healthcare	4
Self-care	4
Patient involvement	4
Medications	1
Care	0

Within the most highly ranked theme 'disease and illness', eight sub-themes were ranked. 'Mental health' was selected as the top priority by 37.9% of respondents followed by 23% of respondents choosing 'long-term conditions' as their top research priority under this theme. Four sub-themes were ranked in order of priority under the 'access' theme. Thirty-seven percent of respondents chose 'availability and presence of primary care services' as their top priority for research under this theme followed by 25% of respondents selecting 'relevance and effectiveness'. Four sub-themes were also ranked in order of priority within the 'workforce' theme. Twenty-nine percent of respondents chose 'recruitment and retention' as their top priority for research under this theme, followed by 23% of respondents selecting 'workload'. There was only one sub-theme identified during the survey for the main theme 'health inequalities' and no sub-themes for 'multidisciplinary teams' and so we did not ask respondents to conduct any further ranking under these themes.

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DISCUSSION

The study illustrates the quantity and breadth of research topics suggested primarily by primary care healthcare professionals. The ranking of research themes in order of research priority identified the following top five priorities: 'disease and illness', 'access', 'workforce', 'multi-disciplinary teams' and 'health Inequalities'. The theme 'integration' attracted many suggestions for research by respondents although only 6% of respondents ranked it as their number one priority for research in the ranking exercise. The theme 'health inequalities' was highly ranked although this theme attracted relatively few suggestions for research compared with other themes that made it into the top five priorities for research. Why the theme 'health inequalities' attracted relatively few suggestions for research could be a consequence of having a much smaller number of respondents participating in the ranking exercise compared to the number of respondents involved in providing suggestions for research (103 *vs.* 512) or it could be that people think and choose differently when given a pre-specified list of themes to rank in order of research priority.

The most highly ranked theme was 'disease and illness' and its sub-themes include the most common conditions treated in primary care, most of which are long-term conditions. For all the conditions listed, including mental health problems, it is more common for people to have multimorbidity (two or more conditions) than the single condition alone.[15] What the suggestions for research categorised under this theme represent is recognition that the effective management in primary care of long-term conditions, either as a single chronic condition or multimorbidity, is going to be crucial for the nation's health. This focus on long-term conditions represents a shift in focus in research priorities for primary care. In a study conducted just over twenty years ago in Scotland, a key research priority for primary care was acute illness.[23]

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Not surprisingly, Covid-19 was one of the conditions recommended by respondents for research because the study took place during the pandemic. Whether 'long-Covid' becomes classified as a new long-term condition is yet to be seen but research about the prevalence, persistence, management and long-term consequences of Covid-19 in primary care will be important to policy and practice in the foreseeable future.

Mental health is one of the top 10 most common conditions for seeking a GP or practice nurse consultation in primary care in Scotland[8] and was the topic that received the most suggestions for research. Again, mental health came to the fore during the global pandemic but was also a key public health concern and was identified as a research priority beforehand in countries such as, Scotland[23] and Australia.[19] During the Covid-19 pandemic a specific mental health concern was highlighted, which is primary care staff stress and burnout and its potential effects on recruitment and retention. The Health and Care (Staffing) (Scotland) Act 2019[24], provides a statutory basis for the provision of staffing, and highlights a duty by government to ensure that there are sufficient numbers of appropriate staffing for the provision of safe and high-quality health care, appropriate training, and the wellbeing of staff. The number of suggestions for research about the primary care workforce that were provided in this study imply that there may be perceived challenges in fulfilling this statutory duty. Staffing levels and work intensity also featured in a study identifying primary care patient safety research priorities in the UK that was published in 2019,[20] which suggests that workforce concerns are not just pertinent to the pandemic, although the pandemic may have exacerbated workforce challenges.

The previous research prioritization study in Scotland identified 'organisation of care' as a key theme and gave reducing inequalities in access to health care and reducing inequalities in health as examples under this theme. Twenty years on, access to primary care and health inequalities remain important research priorities. Health inequalities and access to services are two themes that have

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been identified as priorities in previous primary care research prioritisation exercises conducted in other countries, which implies that these are persistent concerns of global interest that merit further investigation.[16 17 19] Communication and coordination between care providers for instance, was a top 10 research priority for primary care patient safety in the UK.[20] The study found that specific aspects of organisation of care were important research priorities, namely 'multi-disciplinary teams' and 'integration'. The 'Health and Social Care integration: progress review'[25] published in 2019 stated that the main reason for integration was so that care 'feels seamless' for patients. The vision for primary care in Scotland is for an enhanced and expanded multi-disciplinary community,[26] including general practitioners (GPs), alongside other health professionals such as, nurses, dentists, pharmacists, and Allied Health Professionals.[27] Vaccination services, pharmacotherapy services, community treatment and care services, urgent care services and additional professional services including acute musculoskeletal physiotherapy services, community mental health services and community link worker services were shifted from GP Contractors to the responsibility of other professions, albeit with GPs maintaining a professional role in these services in their capacity as expert medical generalists. Respondents suggestions for research and the ranking exercise reflect these policy shifts with recommendations for future research to include a focus on multi-disciplinary teams and integration. Health and social care organisations' response within the first six months of the Covid-19 pandemic required multi-disciplinary effort across organizational boundaries in Scotland.[28] Hence, future pandemics, as well as remobilisation and recovery phases of the current pandemic, may benefit from research to inform a multi-disciplinary approach to care.

Strengths and limitations

The main strengths of this study are that we used an established transparent and systematic approach to identifying research priorities and it involved a large number of healthcare professionals. There were 512 respondents, which is the largest number of healthcare professionals engaging in a research prioritisation exercise about primary care research in Scotland and in other

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countries.[17 19 20] There are however a number of limitations. The study was reliant on the key partners advertising the survey and we do not know how many healthcare professionals received the survey, which means that we are unable to report a response rate. We did not explore respondents' reasons for proposing research suggestions or ranking themes. We did not conduct a systematic literature review to assess gaps in evidence, which is often used in research prioritisation exercises to inform the final selection of top research priorities. Conducting robust literature reviews in relation to the five prioritised themes in future research would be valuable. The study was conducted during the Covid-19 pandemic when staff were already stretched to their limit by having to make major changes to their patterns of work. The research priorities highlighted by respondents must therefore be interpreted in this context. It is possible that a different set of priorities will emerge in the future as the impact of COVID-19 evolves.

Conclusion

There is a need to set research priorities in order to guide research investment and direct resource allocation that will ultimately provide a robust evidence-base to underpin the development and delivery of relevant, quality services for patients in primary care. The findings of this research prioritisation exercise can inform the future direction of research for primary care in Scotland. The themes identified in this study may be used by a broad range of stakeholder groups including; research funders, professional organisations, policy makers, charities and PPI groups to facilitate the setting of the course of research for primary care.

Funding statement

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. However, the Scottish School of Primary Care which led this study does receive a grant from the Scottish Government.

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Competing interests

None declared.

Authors contribution

All authors contributed to writing this manuscript and designing the study protocol by reviewing and commenting on drafts; FG administered the survey; FG, GH and SM analysed the data.

Data sharing statement

An anonymised dataset of all research suggestions is available upon reasonable request to the corresponding author.

Acknowledgements

We wish to thank all survey respondents. We also wish to thank the National Research Scotland Primary Care Patient Public Involvement Group for their input.

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Key partners

Academy of Medical Royal Colleges and Faculties in Scotland (the Scottish Academy)
Advanced Practice Physiotherapy Network
Autism Network Scotland
Association of Advanced Practice Educators UK
BMA General Practitioners Committee Scotland
Chair of Directors of Pharmacy, NHS Boards
Chartered Society of Physiotherapy
Chest Heart & Stroke
Chief Nursing Officer
COSLA - Convention of Scottish Local Authorities
The Scottish Deep End Project
Defence Primary Health Care Scotland
Director of Postgraduate GP Education East
Edinburgh Community Health Forum
General Practice Nursing NHS Education Scotland
Healthcare Improvement Scotland
Health and Social Care Scotland (including Chief Officer Group and IJB Chairs & Vice Chairs Network)
International Foundation for Integrated Care (IFIC)
Mental Health Foundation
National Academy for Social Prescribing
NHS Board Chief Executives
NHS 24 Stakeholder Engagement and Insight
NHS National Services Scotland (NSS)
NRS Primary Care PPI
Penumbra -supporting mental health and wellbeing
PHC Lead Nurse at SG/Primary Care General Practice Nursing
Postgraduate Dean for Pharmacy NES
Programme Director Nursing NES
Public Health Scotland Primary Care Co-Cell Lead
Public Health Scotland
QNIS / Queen's Nursing Institute Scotland
RCGP Scotland
The Richmond Group of Charities, on behalf of the Taskforce on Multiple Conditions
RNIB Scotland
Royal College of General Practitioners
Royal College of Occupational Therapists
Royal College of Nursing Scotland
Royal Pharmaceutical Society (Scotland)
Scottish Ambulance Service, Medical Director
Scottish Community Development Centre/Community Health Exchange
Scottish Government - Division of Primary Care
Scotland's House of Care Programme
Scottish Physiotherapy Amputee Research Group (SPARG)
Scottish Practice Pharmacist and Prescribing Advisors group
Scottish Rural Health Partnership
Scottish Rural Medicine Collaborative
SIGN Scottish Intercollegiate Guidelines Network
Sight Action

For peer review only

SPIRE clinical lead
The Association of Chartered Physiotherapists in Sports and Exercise Medicine
The Health and Social Care Alliance
The Society and College of Radiographers
Voluntary Health Scotland

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Scotland Primary Care Research Prioritisation Exercise survey

We are asking you to complete a short survey (3 questions that will take about 5 minutes to complete) that will ultimately lead to a Top Ten list of priorities for primary care research in Scotland. Before completing the survey please find some information about the study. Please only complete the survey if you live or work in Scotland. **Consent - Sorry you cannot proceed if you do not consent to take part.**

✱ *Required*

Before completing the survey please find some information about the study.

Scotland Primary Care Research Prioritisation Exercise

Our goal is to provide a clear direction for future primary care research so that it benefits the lives of individuals and families, and increases the amount of funding for the most important primary care research. We want to see research made even better with your input.

Purpose of the project

High-quality primary care is underpinned by high-quality research.

The disease COVID-19 that is caused by a new strain of coronavirus is likely to re-direct research priorities and shift research agendas in primary care.

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The aim of this project is to reach a consensus for primary care research priorities in Scotland where uncertainties remain and set a research direction that will be relevant for patients, carers and generalist healthcare professionals for the next 5 years.

It is designed to strengthen future evidence about primary care to improve health outcomes.

Who should do the survey?

Anyone living in Scotland who uses primary care services(patients and carers) or who are healthcare professionals working in Scotland will be eligible to participate in the identification and prioritisation of uncertainties.

Who is leading the project?

The project is led by the Scottish School of Primary Care. Our **key partners** are:

Academy of Medical Royal Colleges and Faculties in Scotland (the Scottish Academy)

Advanced Practice Physiotherapy Network

Autism Network Scotland

Association of Advanced Practice Educators UK

BMA General Practitioners Committee Scotland

Chair of Directors of Pharmacy

Chartered Society of Physiotherapy

Chest Heart & Stroke

Chief Nursing Officer

Community Pharmacy Scotland

COSLA – Convention of Scottish Local Authorities

Director of Postgraduate GP Education

Defence Primary Health Care Scotland

Edinburgh Community Health Forum

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General Practice Nursing – NHS Education Scotland

Healthcare Improvement Scotland

Health and Social Care Partnerships

Health and Social Care Scotland (including Chief Officer Group and The IJB Chairs & Vice Chairs Network)

International Foundation for Integrated Care (IFIC)

Mental Health Foundation

National Academy for Social Prescribing

NHS Chief Executives Board

NHS National Services Scotland (NSS)

NRS Primary Care Network PPI group

NRS Primary Care Network

Penumbra -supporting mental health and wellbeing

PHC Lead Nurse at SG/Primary Care General Practice Nursing

Postgraduate Dean for Pharmacy NES

Programme Director Nursing NES

Public Health Scotland Primary Care Co-Cell Lead

Public Health Scotland

Queen's Nursing Institute Scotland

RNIB Scotland

Royal College of General Practitioners

Royal College of Nursing Scotland

Royal College of Occupational Therapists

Royal Pharmaceutical Society (Scotland)

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Scottish Ambulance Service

Scottish Community Development Centre / Community Health Exchange

Scottish Government - Division of Primary Care

Scotland's House of Care Programme

Scottish Physiotherapy Amputee Research Group (SPARG)

Scottish Practice Pharmacist and Prescribing Advisors group

Scottish Rural Medicine Collaborative

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SIGN – Scottish Intercollegiate Guidelines Network

Sight Action

SPIRE clinical lead

The Association of Chartered Physiotherapists in Sports and Exercise Medicine

The Health and Social Care Alliance

The Richmond Group of Charities, on behalf of the Taskforce on Multiple Conditions

The Scottish Deep End Project

The Society and College of Radiographers

Voluntary Health Scotland

Who is funding the project?

The Scottish Government financially supports the Scottish School of Primary Care.

What about confidentiality?

You can respond anonymously to this survey – you do not have to give your name or contact details. If you are a healthcare professional we will ask you what your occupation is.

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Who do I contact for further information about the study?

Prof Gill Hubbard is leading this project. She is a co-deputy director of the Scottish School of Primary Care.

She can be contacted at the following address or by email:

Prof Gill Hubbard, Department of Nursing, University of the Highlands and Islands, Highland Campus, Centre for Health Science, Old Perth Road, Inverness, IV2 3JH.

Email: gill.hubbard@uhi.ac.uk

What if I wish to complain about the study?

You can submit a written complaint about the study to: Prof Annetta Smith, Department of Nursing, University of the Highlands and Islands, Highland Campus, Centre for Health Science, Old Perth Road, Inverness, IV2 3JH.

Or you can contact her by telephone on: 01851 708250

Or you can email her at: Annetta.Smith@uhi.ac.uk

What will happen with the results?

Outputs will include academic papers, lay reports, infographics and social media feeds.

The project results could be used by funding bodies and decision-makers to influence the types of studies that are conducted by an array of researchers who are typically engaged in primary care research including general practitioners, nurses, pharmacists, psychologists, sociologists, anthropologists, statisticians, health economists, and health services researchers.

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Scotland Primary Care Research Prioritisation Exercise survey

Primary care is provided by generalist health professionals, working together in multidisciplinary and multiagency networks across sectors, with access to the expertise of specialist colleagues. All primary care professionals work flexibly using local knowledge, clinical expertise and a continuously supportive and enabling relationship with the person to make shared decisions about their care and help them to manage their own health and wellbeing.

About you: Where do you live most of the time?

Are you an unpaid carer? An upaid carer is defined as someone who is caring but does not have a contract or doing it as voluntary work.

Please select exactly 1 answer(s).

- ☐ Yes
- ☐ No

Do you consider yourself to have a long-term condition?

Please select exactly 1 answer(s).

- ☐ Yes
- ☐ No

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Do you work in health and / or social care?

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Which sector do you work in?

What sector do you work in? (please tick all that apply)

- ☐ Community Care
- ☐ Government (local or national)
- ☐ Primary Care
- ☐ Secondary Care
- ☐ Third Sector
- ☐ University
- ☐ Other

If you selected Other, please specify:

What is your main profession? (please select one)

- ◉ Allied health profession regulated by Health & Care Profession Council (Please write it down)
- ○ Dentistry regulated by General Dental Council
- ○ Medicine regulated by General Medical Council
- ○ Nursing or Midwifery regulated by Nursing & Midwifery Council
- ○ Pharmacy regulated by General Pharmaceutical Council
- ○ Social work regulated by Scottish Social Services Council
- ○ Other

If you selected 'Allied Health Profession' or 'Other', please specify:

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Research to Improve Primary Care

What topics, issues and concerns do you think are important to research to improve primary care for the next 5 years? Please suggest up to three (in any order)

Suggestion 1.

Suggestion 2.

Suggestion 3.

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Would you be willing to be involved in the next stage where you will be asked to rank a list of research questions in order of priority then please provide your email address:

Please provide email address:

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What happens next..

You have been directed here if you did not consent to take part in the survey OR you have now completed the survey.

What will happen with the results?

Outputs will include academic papers, lay reports, infographics and social media feeds.

The project results could be used by funding bodies and decision-makers to influence the types of studies that are conducted by an array of researchers who are typically engaged in primary care research including general practitioners, nurses, pharmacists, psychologists, sociologists, anthropologists, statisticians, health economists, and health services researchers.

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Final page

Thank you for taking part in the survey.

Key for selection options

1 - We are asking you to complete a short survey (3 questions that will take about 5 minutes to complete) that will ultimately lead to a Top Ten list of priorities for primary care research in Scotland. Before completing the survey please find some information about the study. Please only complete the survey if you live or work in Scotland. Consent - Sorry you cannot proceed if you do not consent to take part.

I consent to take part in the survey
I do not consent to take part

2 - About you: Where do you live most of the time?

Scotland
Not in Scotland

5 - Do you work in health and / or social care?

Yes
No

9 - Would you be willing to be involved in the next stage where you will be asked to rank a list of research questions in order of priority then please provide your email address:

Yes
No

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Theme 1 'Disease and illness' sub-theme 'mental health' examples

Topics	Suggestion examples
Children and young people	• Mental health services in children and adolescents • How can primary and secondary care better work together to care for children and young people with mental disorder, ranging from ADHD to anorexia nervosa. • Improving mental health services. There has been a huge increase in maternal mental health and child and adolescent mental health issues since the Covid 19 pandemic.
Management	• Development of mental health support for those with mental wellbeing difficulties presenting to primary care and being managed in primary care- support worker for self-help and counselling etc • Proactive management of anxiety and mental health - aiming to audit and address this growing unmet need within primary care. • Management plans. Social, spiritual, mental health, where and how you would like to die.
Access	• Improved access to mental well-being support • Mental health provision • Availability of mental health services for adults
Covid-19	• The impact of isolation to people's mental wellbeing during Covid • Deterioration in the mental health of people with Autism and learning difficulties during Covid
MDT	• Issue - lack of AHP particularly OT in primary care. Patients with mental health problems or complex comorbidity who do not meet the criteria for secondary care services cannot access OT services until they become very unwell. Goes against early intervention. • Why there are not more funded training places for people to deliver psychological interventions, i.e. psychologists, when demand greatly outweighs number of spaces currently available, and waiting lists are enormous.
Remote consultations	• Mental health services, particularly remote access
Self-care	• Eating well for your mental health
Early intervention	• Early access to mental health services in the community
Medication	• Inappropriately long durations of antidepressants
Carers	• The impact on the mental health of unpaid carers. Who is caring for the carers? What percentage of carers die before the cared for?
Equity	• The effect on the mental health of people who rely on charities to do their weekly shop

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Theme 1 'Disease and illness' sub-theme 'Covid-19' examples

Topics	Suggestion examples
Management	• Post Covid what the primary care consulting model will look like and how patients will be triaged in the future with potential infections • Long Covid and its issues for patients- what should services look like to support these patients? • Interventions in the community for post-Covid care IT - suggested assessments or interventions especially managing risk etc.
Lived experience	• Living with long Covid' • Post Covid symptoms – long-term recovery and support
Mental health	• Long term effects of Covid-19 on anxiety, depression, especially in young people • Mental health - impact of Covid on patients
Vaccination	• Long term side effects of Covid immunisation and the overall effect – how often will we need a vaccine and what's the longevity of the antibodies?

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Theme 1 'Disease and illness' sub-theme 'long-term conditions' examples

Topics	Suggestion examples
Management	• Management of long-term conditions • Disparity over how we deliver long term condition management and how that affects outcomes • Long term condition monitoring, does it improve morbidity and mortality? If so, for which conditions and what is optimum review interval and requirements'
Self-care	• Self-care of long-term conditions • Supporting patients living with long term conditions to take control of them with support from health care professionals
Remote consultations	• Remote consultant in long term condition management • Use of remote consultation on management of long-term chronic conditions as this group have a high DNA rate for face to face appointments
Prevention	• Primary prevention of long-term conditions. What would really work in the real world

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Theme 1 'Disease and illness' sub-theme 'obesity' examples

Topics	Examples
Prevention	• Better resources and treatments for prevention of obesity, once a patient has gained significant weight very difficult to remove and sustain.
Management	• Weight management/exercise • Obesity management strategies that are accessible for all

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Theme 1 'Disease and illness' sub-theme 'diabetes' examples

Topics	Examples
Prevention	• Diabetes and Obesity at all ages. More needs to be done about healthy eating and life style • Type 2 Diabetes - lifestyle management & prevention of disease or disease progression
Medication	• Cost benefits of GLP-1 receptor activators • Effects of lifestyle v drugs for Diabetes and CV disease and how to effectively deliver these
Lived experience	• Pre-diabetes and progression to type 2 diabetes and the patients experience and what they feel could have been done differently

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Theme 1 'Disease and illness' sub-theme 'dementia' examples

Topics	Examples
Management	• Dementia service / resource • Alternatives to 24hr large group residential settings vs group houses or entire dementia communities to allow safeguarding and independence
Lived experience	• Experience of persons with Dementia / L Disability in Inpatient acute care
Early intervention	• Implementation of OT services for early intervention for people with a dementia diagnosis • More timely diagnosis and access to dementia support. Dementia assessment and treatment to be separate from Mental Health services.
Carers	• Support for carers

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Theme 1 'Disease and illness' sub-theme 'frailty' examples

Topics	Examples
Management	• With an ageing population, a continued long-term strategy to address falls and fragility from cradle to grave • Approaches to frailty and last-years-of-life trajectories.
Mental health	• Impact of COVID/Isolation on mental health within the frail elderly population
Early intervention	• Early intervention for prevention in frailty
Lived experience	• Frailty of people living in own homes

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Theme 1 'Disease and illness' sub-theme 'addiction' examples

Topics	Examples
Management	• The role of Occupational Therapy within addiction, recovery and treatment teams
Medication	• Supporting people with alcohol and drug issues and polypharmacy
Lived experience	• Recovery from Addictions
Mental health	• Mental health services including drug and alcohol and children's services.
Early intervention	• The effect of early intervention (beyond Brief Intervention) on those identified with harmful drinking levels - preventing progress onto Hazardous drinking

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Theme 2 'Access' sub-theme 'availability and presence of services' examples

Topics	Examples
Provision	• Primary care access to psychological therapies and counselling Access to primary care services • How to build in sustainable service developments, particularly that can become community assets • Management of mental health and service availability
Care closer to home	• Access to services in the community/ more funding for community-based hubs • Transfer of services to primary care so that care can be delivered closer to patients' homes, do centralised services such as care and treatment services improve patient care? • Impacts on rural communities in accessing healthcare with redesign to hub healthcare

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Theme 2 'Access' sub-theme 'utilisation and service barriers' examples

Topics	Examples
Accessing healthcare professionals	• Access to nurse and GP appointments • Easy access for patients to GPs and other health professionals. Some may find it difficult to get appointments • Easier access to Medical Professionals' 'Patient access to the wider multidisciplinary team and breaking down barriers that are stopping this • Patient access to GP face to face appointments
Organisational barriers	• How to improve harder to reach patients accessing health services • Far better transport access to hospitals, either public or NHS
Waiting times	• Waiting times • Quicker access to primary care input to prevent escalation to secondary care services • What impact does a 2 year waiting list for psychological therapy have on mental health patients? • Impact of reduced time with the GP and longer waiting times on health outcomes
Patient understanding and expectations	• 'First contact physio service- need to improve patient understanding • Access to services - how to reduce inappropriate demand to improve available provision
Out of hours	• 7 day access to GP surgeries
Accessing during pandemic	• Impact of access challenges in immediate phase 1 of Covid on diagnosis of chronic conditions e.g. depression
Health literacy	• Addressing health literacy to improve outcomes

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Theme 2 'Access' sub-theme 'relevance and effectiveness of services' examples

Topics	Examples
Right service	• How mental health services are meeting the needs of patients within primary care • How Primary care become more responsive to the needs of the community • Effects of 'long Covid' on patients and access to effective treatment • Evaluation of impact of changes to patient engagement with GP practices (including different models, like care navigation, GP first triaging etc
Right time	• Access to early intervention on Mental Health concerns before they worsen • Triage to improve access to the right the person at the right time • How can we improve care for the housebound (who now often end up with reactive care from random professionals

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Theme 2 'Access' sub-theme 'equity' examples

Topics	Examples
Access for all	• Ensuring that services are accessible, acceptable, available and high quality, in line with a rights-based approach to ensuring that services support our shared right to the highest attainable standard of health • Unwarranted variation in care and medicines use across Scotland
Rurality	• The numbers of people living rurally, with no access to a car and miles from the nearest GP practice and the effect on their mental and physical health
Deprivation	• Communication poverty to improve accessibility, participation and citizenship

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Theme 3 'workforce' sub-theme examples

Sub-theme	Examples
Recruitment and retention	• Encourage GPs in primary care • Staff shortages in district nursing
Training and development	• Sharing of best practice and protocols for routine work • Sensory awareness and communication training for all primary care service staff
Workload	• Looking at pay/ employment rights/ annual leave of all practice nurses across Scotland and standardising it • The patient contact workload of GPs and impact on GP workforce and safety
Mental health	• Supporting staff's wellbeing when working from home • Burnout in the primary care workforce
GMS contract	• Impact of the 2018 GP contract

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Theme 4 'multi-disciplinary team' examples

Theme	Examples
MDT	• Added value of MDT in primary care? • Primary care is becoming more of an MDT; patient perspectives on this? • Effectiveness of nurse-led clinics • Unique contribution of occupational therapy service provision in early intervention for prevention model of service delivery within MDT in primary care setting • What is the role of the General Practice Nurse in 2030?

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Theme 5 'Integration' sub-theme examples

Sub-theme	Examples
Multi-agency working and collaboration	• Links with primary care and community rehabilitation teams • Impact of care at home through multi- agencies versus controlled agency commitment • Prioritisation in the context of health and social care need (not just health need) • Inclusive Communication Strategy across all primary care services
Continuity of care	• How Primary care can ensure continuity of care between themselves and the patient • Tools to measure continuity of care reliably
Social prescribing	• How to ensure the majority GPs to actively promote and utilise social prescribing • The extent to which community link workers in primary care practices are making measurable differences to patients' wellbeing and to health inequalities

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Theme 6 'health inequalities' examples

Theme	Examples
Health inequalities	• What measurable impact will primary care make on health inequalities across Scotland over the next 5 years?
Deprivation	• Poverty and the impact this has on health and wellbeing

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BMJ Open

A survey to identify research priorities for primary care in Scotland during and following the Covid-19 pandemic

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-056817.R1
Article Type:	Original research
Date Submitted by the Author:	06-Jan-2022
Complete List of Authors:	Hubbard, Gill; University of the Highlands and Islands, Nursing and Midwifery Grist, Fiona; University of the Highlands and Islands, nursing and midwifery Pope, Lindsey; University of Glasgow Cunningham , S ; Robert Gordon University Maxwell, Margaret; University of Stirling, Nursing, Midwifery and Allied Health Professions Research Unit Bennie, Marion; University of Strathclyde, Pharmaceutical Sciences Guthrie, Bruce; University of Edinburgh College of Medicine and Veterinary Medicine Mercer, Stewart; The University of Edinburgh, The Usher Institute of Population Health Sciences and Informatics
Primary Subject Heading:	General practice / Family practice
Secondary Subject Heading:	Evidence based practice, Health policy, Health services research
Keywords:	PRIMARY CARE, QUALITATIVE RESEARCH, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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TITLE

A survey to identify research priorities for primary care in Scotland during and following the Covid-19 pandemic

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ABSTRACT (290 words)

Objectives: To identify research priorities for primary care in Scotland following the Covid-19 pandemic.

Design: Modified James Lind Alliance methodology; respondents completed an on-line survey to make research suggestions and rank research themes in order of priority.

Setting: Scotland primary care

Participants: Healthcare professionals in primary care in Scotland and members of primary care Patient and Public Involvement (PPI) groups. 512 respondents provided research suggestions; 8% (n=40) did not work in health or social care; of those who did work, 68.8% worked in primary care, 16.3% community care, 11.7% secondary care, 4.5% third sector, 4.2% university (respondents could select multiple options). Of those respondents who identified as healthcare professionals, 33% were in nursing and midwifery professions, 25% were in Allied Health Professions (of whom, 45% were occupational therapists and 35% were physiotherapists), 20% were in the medical profession and 10% were in the pharmacy profession.

Main outcomes: Suggestions for research for primary care made by respondents were categorised into themes and sub-themes by researchers and ranked in order of priority by respondents.

Results: There were 1,274 research suggestions which were categorised under 12 themes and 30 sub-themes. One hundred and three (20%) respondents to the survey participated in ranking the list of 12 themes in order of research priority. The five most highly ranked research priorities were: disease and illness, health inequalities, access, workforce, and multi-disciplinary teams. The disease and illness theme had the greatest number of suggestions for research and was scored the most highly in the ranking exercise. The sub-theme ranked as the most important research priority in the 'disease and illness' theme was 'mental health'.

Conclusions: The themes and sub-themes identified in this study should inform research funders so that the direction of primary healthcare is informed by evidence.

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Strengths and limitations of this study

- This is the first comprehensive, primary care research priority setting exercise since the 2020 onset of the coronavirus pandemic.
- A transparent and systematic approach to identifying research priorities was used.
- The study included nurses, pharmacists, Allied Health Professionals and medical professionals and PPI group members.
- We do not know how many healthcare professionals received the survey which means that we are unable to report a response rate.
- We did not conduct a literature search to assess gaps in evidence relating to the research priorities.

Word count 3,195

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INTRODUCTION

The Covid-19 pandemic has had a significant impact on primary care[1-3] and so it is timely to set research priorities in order to support recovery. Primary care is the foundation of equitable and affordable healthcare,[4] especially in countries with universal coverage and a National Health Service (NHS) as in the United Kingdom (UK).[5] Scotland, as a devolved nation, is responsible for the funding and planning of its healthcare system with high quality primary care at the heart of its vision.[6] High quality primary care needs to be underpinned by high-quality research and evaluation.[7] Primary care is usually a person's first point of contact with the NHS[8] and it is where most patient contacts occur.[6] In this study, we adopted the following definition of primary care that has been agreed by a range of professional organisations in Scotland:

> "Primary care is provided by generalist health professionals, working together in multidisciplinary and multiagency networks across sectors, with access to the expertise of specialist colleagues. All primary care professionals work flexibly using local knowledge, clinical expertise and a continuously supportive and enabling relationship with the person to make shared decisions about their care and help them to manage their own health and wellbeing".[9]

Vertical (i.e. disease-specific) approaches to healthcare have been effective at reducing morbidity and mortality from specific conditions but have been criticized for detrimentally affecting the resources available to, and capacity of local primary care.[10] Research priorities set from a generalist and multi-professional perspective are also important and of value to patients and carers.[11-14] The high and increasing prevalence of multimorbidity associated with population ageing means that there is an increasing need for care which focusses on supporting people with multiple conditions.[15] Hence, there is a need to set both vertical (disease) and horizontal (generalist primary care) research

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priorities in order to guide research investment and direct resource allocation that will ultimately provide a robust evidence-base to underpin the development and delivery of primary care.

A number of previously published studies have identified primary care research priorities and the reach of these studies has varied with research priorities variously being developed internationally,[16] in low and middle income countries,[17] in the European Union,[18] or in single countries.[19] An argument for setting research priorities in one country, or a cluster of similar countries is because the challenges faced by primary care in different countries vary due to factors such as population characteristics (for example, an ageing population), diverse social cultures and norms, and different healthcare systems (for example, public and private healthcare systems).[18] Research priorities identified in several previous research prioritisation exercises include how primary care should be financed, organised and staffed,[16-20] the importance of implementation and translation of knowledge and evidence into primary care,[16 19] addressing multimorbidity,[16 19 20] promoting health equity,[16 19] promoting healthy behaviours in the population,[16 19] universal health coverage and health access,[16 17] digital delivery of primary care,[16 19] and the involvement of patients in the design and delivery of primary care. [16 19]

The aim of this study was to identify primary care research priorities in Scotland and set a research direction that will be relevant for patients, carers and generalist healthcare professionals in the aftermath of the coronavirus pandemic. This is the first comprehensive, generalist health professional project of primary care research priorities since the 2020 onset of the coronavirus pandemic. It is designed to strengthen future evidence for primary care to improve health outcomes.

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METHODS

This study adapted the James Lind Alliance (JLA) methodology.[21] The Steering Group for the project was the Scottish School of Primary Care (SSPC) Executive (http://www.sspc.ac.uk), which included an individual from a primary care Patient and Public Involvement (PPI) group, clinical academics and primary care researchers from Scottish universities. The following steps were taken to deliver the project:

Step 1&2: Identifying key partners and raising awareness of the study

'Key partner' organisations were identified through a process of peer knowledge and consultation, and through the Steering Group members' networks. Fifty-four key partner organisation agreed to participate by advertising the project and circulating the link to the survey to their members (Supplementary File 1: Key Partners).

Step 3: Identifying research priorities

The Steering Group administered an online survey via the key partner organisations for respondents to identify an initial set of research priorities (Supplementary File 2: Research priorities Survey). Healthcare professionals in primary care in Scotland were eligible to participate in the identification and prioritisation of research for primary care. Members of primary care PPI groups were also invited, including members of the National Research Scotland Primary Care PPI group. A period of three months was given to complete the survey (4th December 2020 – 1st March 2021). Responses were solicited with the following open-ended query that was used in a previous international JLA primary care research priorities project: "Please suggest up to three important primary care research questions" [16]. Responses were anonymous (no names were requested during the survey). Respondents were asked to provide an email if they were willing to participate in subsequent steps of the project, but these emails were stored separately from the submitted priorities. Results were downloaded from Online Survey to an Excel spreadsheet for the purposes of analysis in Step 4.

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Step 4: Analysis and identifying research themes and sub-themes

The submissions of all respondents were analysed collectively. Suggestions for research by respondents were grouped into themes and sub-themes by two members of the Steering Group (GH, FG), with the theoretical framework developed iteratively over several meetings including involvement of a third member of the group (SM) to resolve disagreements. Suggestions for research were allowed to be categorised under more than one theme. If a group of suggestions on the same topic totalled <1 percent (i.e. ≤12 suggestions) of the total number of research suggestions then a theme was not created. Sub-themes were identified within a theme when approximately ≥10% of suggestions were on a similar topic. Theme and sub-theme names were chosen from current policy and literature for example, sub-themes for the theme 'access' were drawn from a published definition of 'access' which included provision and availability of primary care services, equity of access, people's use of services and barriers to getting access as well as the dimension of effectiveness of using the service.[22]

The submissions of the sub-group who were not health and social care professionals (n=40) were included in the above exercise and also analysed separately to determine if there were any themes that were unique to this group.

Step 5: Ranking themes and research prioritisation

The aim of the final stage of the priority setting process was to rank the primary care research themes in order of priority. The respondents in Step 3 who wished to participate in this step were invited by email to rank the list of the summary research themes and sub-themes in order of priority. This exercise was done using an online survey, which was open for 1 month. Respondents

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were asked to rank 12 research themes that had been identified in Step 4 in order of priority, and to rank all sub-themes.

Patient and Public Involvement and Engagement

Several meetings between GH and the National Research Scotland Primary Care Public Involvement Group were held so that patients could contribute towards developing the protocol for this study. This group was also a key partner.

Ethical approval

Independent advice was sought from NHS Grampian Research Ethics Committee and University of Highlands and Islands Research Ethics Committee, who both advised that the project did not require research ethics review because the study was identifying research priorities and not conducting the research.

RESULTS

Respondent characteristics

There were 512 respondents. Eight percent (n=40) of respondent did not work in health or social care and therefore for the purposes of this study were regarded as patients, carers and members of the general public. Of those who did work, 68.8% worked in primary care, 16.3% community care, 11.7% secondary care, 4.5% third sector, 4.2% university (respondents could select multiple options for place of work). Table 1 shows the health and social care professions of respondents (n=472).

Table 1: Health and social care professions of respondents

Profession	N = 472 (%)

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Allied health profession regulated by Health and Care Profession	120 (25.4%)
Dentistry regulated by General Dental Council	5 (11%)
Medicine regulated by General Medical Council	95 (20.1%)
Nursing or Midwifery regulated by Nursing & Midwifery Council	157 (33.3%)
Pharmacy regulated by General Pharmaceutical Council	49 (10.4%)
Social work regulated by Scottish Social Services Council	2 (0.4%)
Other	44 (9.3%)

Of those respondents who were healthcare professionals, 33% were in nursing and midwifery professions regulated by the Nursing and Midwifery Council, 25% in Allied Health Professions regulated by the Health and Care Profession Council (of whom, 45% were occupational therapists and 35% were physiotherapists), 20% were in the medical profession regulated by the General Medical Council and 10% were in the pharmacy profession regulated by the General Pharmaceutical Council.

Research themes and sub-themes

The total number of research suggestions was 1,274. Research suggestions were categorised under 12 themes and 30 sub-themes (Table 2). The 12 themes and their associated sub-themes are positioned in order of the quantity of suggestions for research. Five themes had over 100 suggestions for research; these were 'disease and illness', 'access', 'workforce', 'multidisciplinary teams' and 'integration'. Hence, based on the number of suggestions for research, these are the top five priorities for research.

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Table 2: Themes and associated sub-themes in order of the quantity of research suggestions that were categorised under each theme and sub-theme (n=512 respondents)

Theme	Number[a]	Sub-themes	Number[a]
Disease and illness	461	Mental health	168
		Covid-19	58
		Long-term conditions	42
		Obesity	27
		Diabetes	18
		Dementia	16
		Frailty	14
		Addiction	14
Access	202	Availability and presence of services	72
		Utilisation of services and barriers	61
		Relevance & effectiveness of services	43
		Equity	26
Workforce	164	Recruitment and retention	58
		Training and development	54
		Workload	31
		Mental health	22
		GMS contract	11
Multi-disciplinary teams (MDT)	143	-	-
Integration	108	Multi-agency working & collaboration	74
		Social prescribing	20
		Continuity of care	14
Digital healthcare	96	Remote consultations	56
		Remote care	23
		IT systems	12
		Telephone triage	5
Self-care	84	Lifestyle	44
Primary / secondary care interface	62	Communication	9
		Continuity of care	9
Medications	55	-	-
Health inequalities	30	Deprivation	15
Carers	19	-	-
Patient involvement	13	Research	7
		Care	6

a. number of research suggestions categorised under a theme and sub-theme. Not all suggestions made by respondents were categorised under a theme or sub-theme.

The theme with the most suggestions for research was 'disease and illness'; the associated sub-themes indicate multiple long-term conditions. The sub-theme with the most suggestions for

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research under this theme was 'mental health'. The theme with the second most suggestions for research was 'access' and included suggestions about the availability of primary care services, utilisation of these services and barriers to access, the relevance and effectiveness of these services and equity of access. 'Workforce' was the theme that had the third most suggestions for research and included suggestions about recruitment and retention of primary care staff, training and development, workload, staff mental health, and GMS Contract. 'Multi-disciplinary teams' (MDT) was the theme that contained the fourth most suggestions for research. Twenty-eight percent of suggestions did not specifically refer to a particular profession, 23% referred to nurses, 17% occupational therapists, 13% Allied Health Professions, 8% pharmacists, 4% physiotherapists and 3% psychologists. 'Integration' was the theme that had the fifth most suggestions for research; associated sub-themes were multi-agency working and collaboration, social prescribing and continuity of care. Examples of research suggestions for each theme can be found in Supplementary File 3.

Figure 1 shows the themes of respondents who were not a health and social care professional (n=40). It shows that most research suggestions of this sub-group were categorised under the themes 'disease and illness' and 'access.' These were the themes with the highest number of research suggestions in the total group of respondents. The theme 'integration' had the third highest number of research suggestions and the theme 'self-care' had the fourth highest number of suggestions for research in this sub-group whereas these themes were fifth and seventh in the total group of respondents.

Insert Figure 1 here

Ranking of research themes and sub-themes

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One hundred and three (20%) respondents to the survey participated in ranking the list of 12 themes in order of research priority (Table 3). The five most highly ranked themes were as follows: 19.4% of respondents chose 'disease and illness', 17.4% chose 'health inequalities', 14.5% chose 'access', 12.6% chose 'workforce' and 12.6% chose 'multi-disciplinary team' as their number one top research priority. Hence, based on this ranking exercise, these are the top five priorities for research.

Table 3: Themes ranked as the number one top research priority (n=103 respondents)

Theme	Number of respondents ranking as top research priority
Disease and illness	20
Health inequalities	18
Access	15
Workforce	13
Multidisciplinary teams	13
Integration	6
Primary / secondary care interface	5
Digital healthcare	4
Self-care	4
Patient involvement	4
Medications	1
Care	0

Within the most highly ranked theme 'disease and illness', eight sub-themes were ranked. 'Mental health' was selected as the top priority by 37.9% of respondents followed by 23% of respondents choosing 'long-term conditions' as their top research priority under this theme. Four sub-themes were ranked in order of priority under the 'access' theme. Thirty-seven percent of respondents chose 'availability and presence of primary care services' as their top priority for research under this theme followed by 25% of respondents selecting 'relevance and effectiveness'. Four sub-themes were also ranked in order of priority within the 'workforce' theme. Twenty-nine percent of respondents chose 'recruitment and retention' as their top priority for research under this theme, followed by 23% of respondents selecting 'workload'. There was only one sub-theme identified during the survey for the main theme 'health inequalities' and no sub-themes for 'multidisciplinary

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teams' and so we did not ask respondents to conduct any further ranking under these themes. No sub-group analysis was conducted because we did not know which respondents (e.g. if they worked in health and social care) from the survey participated in the ranking exercise.

DISCUSSION

The study illustrates the quantity and breadth of research topics suggested primarily by primary care healthcare professionals. The study highlights that there are some differences between the themes with the greatest number of suggestions for research (Table 2) and the themes scored highly in the ranking exercise (Table 3); we therefore present both as a basis for research prioritization. The ranking of research themes in order of research priority identified the following top five priorities: 'disease and illness', 'access', 'workforce', 'multi-disciplinary teams' and 'health Inequalities'. The theme 'integration' attracted many suggestions for research by respondents although only 6% of respondents ranked it as their number one priority for research in the ranking exercise. The theme 'health inequalities' was highly ranked although this theme attracted relatively few suggestions for research compared with other themes that made it into the top five priorities for research. Why the theme 'health inequalities' attracted relatively few suggestions for research could be a consequence of having a much smaller number of respondents participating in the ranking exercise compared to the number of respondents involved in providing suggestions for research (103 *vs.* 512) or it could be that people think and choose differently when given a pre-specified list of themes to rank in order of research priority.

The study shows that the two top priorities for research – 'disease and illness' and 'access' for the total group of respondents were also the top two priorities for research when the sub-group of respondents who did not work in health and social care were analysed separately. However, there were some differences in the number of research suggestions for other themes, which highlights that research priorities may vary depending on which groups of the population are involved in the

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prioritisation exercise. A strength of this study is that it presents priorities for research identified across a wide range of professions.

The most highly ranked theme was 'disease and illness' and its sub-themes include the most common conditions treated in primary care, most of which are long-term conditions. For all the conditions listed, including mental health problems, it is more common for people to have multimorbidity (two or more conditions) than the single condition alone.[15] What the suggestions for research categorised under this theme represent is recognition that the effective management in primary care of long-term conditions, either as a single chronic condition or multimorbidity, is going to be crucial for the nation's health. This focus on long-term conditions represents a shift in focus in research priorities for primary care. In a study conducted just over twenty years ago in Scotland, a key research priority for primary care was acute illness.[23]

Not surprisingly, Covid-19 was one of the conditions recommended by respondents for research because the study took place during the pandemic. Whether 'long-Covid' becomes classified as a new long-term condition is yet to be seen but research about the prevalence, persistence, management and long-term consequences of Covid-19 in primary care will be important to policy and practice in the foreseeable future. It is perhaps surprising that Covid-19 vaccination development, or at least its delivery in primary care, did not feature as a prominent suggestion for research since the first vaccine was given on 8th December 2020 in the UK and this survey was open between 4th December 2020 and 1st March 2021. A qualitative study exploring respondents' rationales for their suggestions for research would provide a much richer understanding of prioritization for research including reasons why certain topics are not prioritized.

Mental health is one of the top 10 most common conditions for seeking a GP or practice nurse consultation in primary care in Scotland[8] and was the topic that received the most suggestions for

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research. Again, mental health came to the fore during the global pandemic but was also a key public health concern and was identified as a research priority beforehand in countries such as, Scotland[23] and Australia.[19] During the Covid-19 pandemic a specific mental health concern has been highlighted, which is primary care staff stress and burnout and its potential effects on recruitment and retention.[24] The Health and Care (Staffing) (Scotland) Act 2019[25], provides a statutory basis for the provision of staffing, and highlights a duty by government to ensure that there are sufficient numbers of appropriate staffing for the provision of safe and high-quality health care, appropriate training, and the wellbeing of staff. The number of suggestions for research about the primary care workforce that were provided in this study imply that there may be perceived challenges in fulfilling this statutory duty. Staffing levels and work intensity also featured in a study identifying primary care patient safety research priorities in the UK that was published in 2019,[20] which suggests that workforce concerns are not just pertinent to the pandemic, although the pandemic may have exacerbated workforce challenges.

The previous research prioritization study in Scotland identified 'organisation of care' as a key theme and gave reducing inequalities in access to health care and reducing inequalities in health as examples under this theme. Twenty years on, access to primary care and health inequalities remain important research priorities. Health inequalities and access to services are two themes that have been identified as priorities in previous primary care research prioritisation exercises conducted in other countries, which implies that these are persistent concerns of global interest that merit further investigation.[16 17 19] Communication and coordination between care providers for instance, was a top 10 research priority for primary care patient safety in the UK.[20] The study found that specific aspects of organisation of care were important research priorities, namely 'multi-disciplinary teams' and 'integration'. The 'Health and Social Care integration: progress review'[26] published in 2019 stated that the main reason for integration was so that care 'feels seamless' for patients. The vision for primary care in Scotland is for an enhanced and expanded multi-disciplinary community,[27] including

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general practitioners (GPs), alongside other health professionals such as, nurses, dentists, pharmacists, and Allied Health Professionals.[28] Vaccination services, pharmacotherapy services, community treatment and care services, urgent care services and additional professional services including acute musculoskeletal physiotherapy services, community mental health services and community link worker services were shifted from GP Contractors to the responsibility of other professions, albeit with GPs maintaining a professional role in these services in their capacity as expert medical generalists. Respondents suggestions for research and the ranking exercise reflect these policy shifts with recommendations for future research to include a focus on multi-disciplinary teams and integration. Health and social care organisations' response within the first six months of the Covid-19 pandemic required multi-disciplinary effort across organizational boundaries in Scotland.[29] Hence, future pandemics, as well as remobilisation and recovery phases of the current pandemic, may benefit from research to inform a multi-disciplinary approach to care.

Strengths and limitations

The main strengths of this study are that we used an established transparent and systematic approach to identifying research priorities and it involved a large number of healthcare professionals in Scotland. There were 512 respondents, of which 472 were health and social care professionals; this is the largest number of healthcare professionals engaging in a research prioritisation exercise about primary care research in Scotland and in other countries.[17 19 20] There are however a number of limitations. The study was reliant on the key partners advertising the survey and we do not know how many healthcare professionals received the survey, which means that we are unable to report a response rate. We did not explore respondents' reasons for proposing research suggestions or ranking themes. We were not able to describe which respondents (e.g. if they worked in health and social care and their profession) from the survey participated in the ranking exercise. We did not conduct a systematic literature review to assess gaps in evidence, which is often used in research prioritisation exercises to inform the final selection of top research priorities. Conducting robust

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literature reviews in relation to the five prioritised themes in future research would be valuable. The study was conducted during the second wave (September 2020 – April 2021)[30] of the pandemic when staff were already stretched to their limit by having to make major changes to their patterns of work. The research priorities highlighted by respondents must therefore be interpreted in this Scottish context. It is possible that a different set of priorities will emerge in the future as the impact of COVID-19 evolves.

Conclusion

There is a need to set research priorities in order to guide research investment and direct resource allocation that will ultimately provide a robust evidence-base to underpin the development and delivery of relevant, quality services for patients in primary care. The findings of this research prioritisation exercise can inform the future direction of research for primary care in Scotland. The themes identified in this study may be used by a broad range of stakeholder groups including; research funders, professional organisations, policy makers, charities and PPI groups to facilitate the setting of the course of research for primary care.

Funding statement

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. However, the Scottish School of Primary Care which led this study does receive a grant from the Scottish Government.

Competing interests

None declared.

Authors contribution

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(1) GH, LP, SC, MM, MB, BG, SM conceived and designed the study; FG administered the survey; GH, FG, SM conducted the analysis and interpreted the data; (2) GH, LP, SC, MM, BG, SM, FG, MB drafted the manuscript and revised it critically for important intellectual content, and (3) gave final approval of the version of the manuscript to be published; (4) GH, LP, SC, MM, BG, SM, FG, MB agree to be accountable for all aspects of the work.

Data sharing statement

An anonymised dataset of all research suggestions is available upon reasonable request to the corresponding author.

Acknowledgements

We wish to thank all survey respondents. We also wish to thank the National Research Scotland Primary Care Patient Public Involvement Group for their input.

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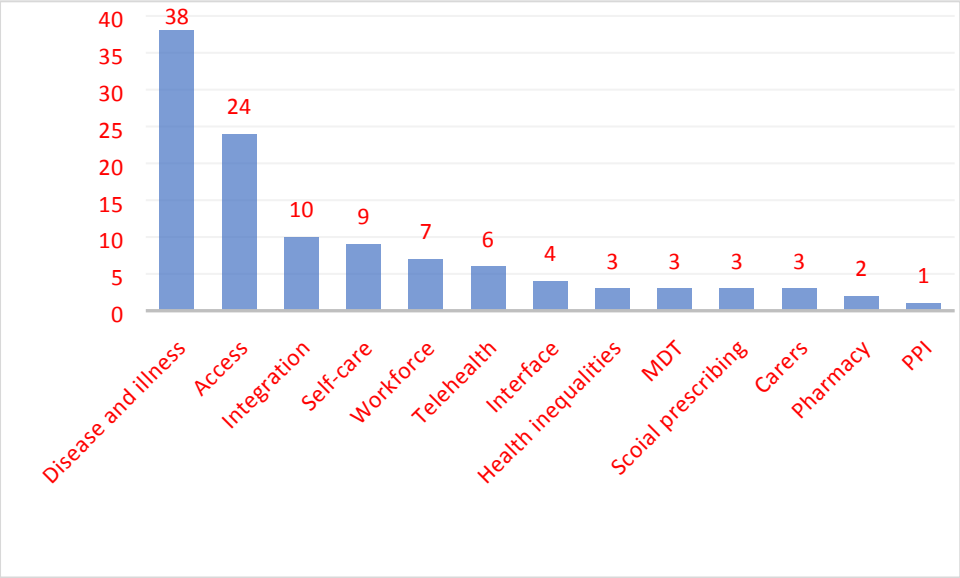
Figure 1: Themes of respondents who were not health and social care professionals (n=40 respondents)



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Key partners

Academy of Medical Royal Colleges and Faculties in Scotland (the Scottish Academy)
Advanced Practice Physiotherapy Network
Autism Network Scotland
Association of Advanced Practice Educators UK
BMA General Practitioners Committee Scotland
Chair of Directors of Pharmacy, NHS Boards
Chartered Society of Physiotherapy
Chest Heart & Stroke
Chief Nursing Officer
COSLA - Convention of Scottish Local Authorities
The Scottish Deep End Project
Defence Primary Health Care Scotland
Director of Postgraduate GP Education East
Edinburgh Community Health Forum
General Practice Nursing NHS Education Scotland
Healthcare Improvement Scotland
Health and Social Care Scotland (including Chief Officer Group and IJB Chairs & Vice Chairs Network)
International Foundation for Integrated Care (IFIC)
Mental Health Foundation
National Academy for Social Prescribing
NHS Board Chief Executives
NHS 24 Stakeholder Engagement and Insight
NHS National Services Scotland (NSS)
NRS Primary Care PPI
Penumbra -supporting mental health and wellbeing
PHC Lead Nurse at SG/Primary Care General Practice Nursing
Postgraduate Dean for Pharmacy NES
Programme Director Nursing NES
Public Health Scotland Primary Care Co-Cell Lead
Public Health Scotland
QNIS / Queen's Nursing Institute Scotland
RCGP Scotland
The Richmond Group of Charities, on behalf of the Taskforce on Multiple Conditions
RNIB Scotland
Royal College of General Practitioners
Royal College of Occupational Therapists
Royal College of Nursing Scotland
Royal Pharmaceutical Society (Scotland)
Scottish Ambulance Service, Medical Director
Scottish Community Development Centre/Community Health Exchange
Scottish Government - Division of Primary Care
Scotland's House of Care Programme
Scottish Physiotherapy Amputee Research Group (SPARG)
Scottish Practice Pharmacist and Prescribing Advisors group
Scottish Rural Health Partnership
Scottish Rural Medicine Collaborative
SIGN Scottish Intercollegiate Guidelines Network
Sight Action

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SPIRE clinical lead
The Association of Chartered Physiotherapists in Sports and Exercise Medicine
The Health and Social Care Alliance
The Society and College of Radiographers
Voluntary Health Scotland

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Scotland Primary Care Research Prioritisation Exercise survey

We are asking you to complete a short survey (3 questions that will take about 5 minutes to complete) that will ultimately lead to a Top Ten list of priorities for primary care research in Scotland. Before completing the survey please find some information about the study. Please only complete the survey if you live or work in Scotland. **Consent - Sorry you cannot proceed if you do not consent to take part.**

✱ *Required*

Before completing the survey please find some information about the study.

Scotland Primary Care Research Prioritisation Exercise

Our goal is to provide a clear direction for future primary care research so that it benefits the lives of individuals and families, and increases the amount of funding for the most important primary care research. We want to see research made even better with your input.

Purpose of the project

High-quality primary care is underpinned by high-quality research.

The disease COVID-19 that is caused by a new strain of coronavirus is likely to re-direct research priorities and shift research agendas in primary care.

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The aim of this project is to reach a consensus for primary care research priorities in Scotland where uncertainties remain and set a research direction that will be relevant for patients, carers and generalist healthcare professionals for the next 5 years.

It is designed to strengthen future evidence about primary care to improve health outcomes.

Who should do the survey?

Anyone living in Scotland who uses primary care services(patients and carers) or who are healthcare professionals working in Scotland will be eligible to participate in the identification and prioritisation of uncertainties.

Who is leading the project?

The project is led by the Scottish School of Primary Care. Our **key partners** are:

Academy of Medical Royal Colleges and Faculties in Scotland (the Scottish Academy)

Advanced Practice Physiotherapy Network

Autism Network Scotland

Association of Advanced Practice Educators UK

BMA General Practitioners Committee Scotland

Chair of Directors of Pharmacy

Chartered Society of Physiotherapy

Chest Heart & Stroke

Chief Nursing Officer

Community Pharmacy Scotland

COSLA – Convention of Scottish Local Authorities

Director of Postgraduate GP Education

Defence Primary Health Care Scotland

Edinburgh Community Health Forum

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General Practice Nursing – NHS Education Scotland

Healthcare Improvement Scotland

Health and Social Care Partnerships

Health and Social Care Scotland (including Chief Officer Group and The IJB Chairs & Vice Chairs Network)

International Foundation for Integrated Care (IFIC)

Mental Health Foundation

National Academy for Social Prescribing

NHS Chief Executives Board

NHS National Services Scotland (NSS)

NRS Primary Care Network PPI group

NRS Primary Care Network

Penumbra -supporting mental health and wellbeing

PHC Lead Nurse at SG/Primary Care General Practice Nursing

Postgraduate Dean for Pharmacy NES

Programme Director Nursing NES

Public Health Scotland Primary Care Co-Cell Lead

Public Health Scotland

Queen's Nursing Institute Scotland

RNIB Scotland

Royal College of General Practitioners

Royal College of Nursing Scotland

Royal College of Occupational Therapists

Royal Pharmaceutical Society (Scotland)

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Scottish Ambulance Service

Scottish Community Development Centre / Community Health Exchange

Scottish Government - Division of Primary Care

Scotland's House of Care Programme

Scottish Physiotherapy Amputee Research Group (SPARG)

Scottish Practice Pharmacist and Prescribing Advisors group

Scottish Rural Medicine Collaborative

Scottish Rural Health Partnership

SIGN – Scottish Intercollegiate Guidelines Network

Sight Action

SPIRE clinical lead

The Association of Chartered Physiotherapists in Sports and Exercise Medicine

The Health and Social Care Alliance

The Richmond Group of Charities, on behalf of the Taskforce on Multiple Conditions

The Scottish Deep End Project

The Society and College of Radiographers

Voluntary Health Scotland

Who is funding the project?

The Scottish Government financially supports the Scottish School of Primary Care.

What about confidentiality?

You can respond anonymously to this survey – you do not have to give your name or contact details. If you are a healthcare professional we will ask you what your occupation is.

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Who do I contact for further information about the study?

Prof Gill Hubbard is leading this project. She is a co-deputy director of the Scottish School of Primary Care.

She can be contacted at the following address or by email:

Prof Gill Hubbard, Department of Nursing, University of the Highlands and Islands, Highland Campus, Centre for Health Science, Old Perth Road, Inverness, IV2 3JH.

Email: gill.hubbard@uhi.ac.uk

What if I wish to complain about the study?

You can submit a written complaint about the study to: Prof Annetta Smith, Department of Nursing, University of the Highlands and Islands, Highland Campus, Centre for Health Science, Old Perth Road, Inverness, IV2 3JH.

Or you can contact her by telephone on: 01851 708250

Or you can email her at: Annetta.Smith@uhi.ac.uk

What will happen with the results?

Outputs will include academic papers, lay reports, infographics and social media feeds.

The project results could be used by funding bodies and decision-makers to influence the types of studies that are conducted by an array of researchers who are typically engaged in primary care research including general practitioners, nurses, pharmacists, psychologists, sociologists, anthropologists, statisticians, health economists, and health services researchers.

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Scotland Primary Care Research Prioritisation Exercise survey

Primary care is provided by generalist health professionals, working together in multidisciplinary and multiagency networks across sectors, with access to the expertise of specialist colleagues. All primary care professionals work flexibly using local knowledge, clinical expertise and a continuously supportive and enabling relationship with the person to make shared decisions about their care and help them to manage their own health and wellbeing.

About you: Where do you live most of the time?

Are you an unpaid carer? An upaid carer is defined as someone who is caring but does not have a contract or doing it as voluntary work.

Please select exactly 1 answer(s).

- ☐ Yes
- ☐ No

Do you consider yourself to have a long-term condition?

Please select exactly 1 answer(s).

- ☐ Yes
- ☐ No

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Do you work in health and / or social care?

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Which sector do you work in?

What sector do you work in? (please tick all that apply)

- ☐ Community Care
- ☐ Government (local or national)
- ☐ Primary Care
- ☐ Secondary Care
- ☐ Third Sector
- ☐ University
- ☐ Other

If you selected Other, please specify:

What is your main profession? (please select one)

- ◉ Allied health profession regulated by Health & Care Profession Council (Please write it down)
- ○ Dentistry regulated by General Dental Council
- ○ Medicine regulated by General Medical Council
- ○ Nursing or Midwifery regulated by Nursing & Midwifery Council
- ○ Pharmacy regulated by General Pharmaceutical Council
- ○ Social work regulated by Scottish Social Services Council
- ○ Other

If you selected 'Allied Health Profession' or 'Other', please specify:

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Research to Improve Primary Care

What topics, issues and concerns do you think are important to research to improve primary care for the next 5 years? Please suggest up to three (in any order)

Suggestion 1.

Suggestion 2.

Suggestion 3.

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Would you be willing to be involved in the next stage where you will be asked to rank a list of research questions in order of priority then please provide your email address:

Please provide email address:

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What happens next..

You have been directed here if you did not consent to take part in the survey OR you have now completed the survey.

What will happen with the results?

Outputs will include academic papers, lay reports, infographics and social media feeds.

The project results could be used by funding bodies and decision-makers to influence the types of studies that are conducted by an array of researchers who are typically engaged in primary care research including general practitioners, nurses, pharmacists, psychologists, sociologists, anthropologists, statisticians, health economists, and health services researchers.

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Final page

Thank you for taking part in the survey.

Key for selection options

1 - We are asking you to complete a short survey (3 questions that will take about 5 minutes to complete) that will ultimately lead to a Top Ten list of priorities for primary care research in Scotland. Before completing the survey please find some information about the study. Please only complete the survey if you live or work in Scotland. Consent - Sorry you cannot proceed if you do not consent to take part.

I consent to take part in the survey
I do not consent to take part

2 - About you: Where do you live most of the time?

Scotland
Not in Scotland

5 - Do you work in health and / or social care?

Yes
No

9 - Would you be willing to be involved in the next stage where you will be asked to rank a list of research questions in order of priority then please provide your email address:

Yes
No

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Theme 1 'Disease and illness' sub-theme 'mental health' examples

Topics	Suggestion examples
Children and young people	• Mental health services in children and adolescents • How can primary and secondary care better work together to care for children and young people with mental disorder, ranging from ADHD to anorexia nervosa. • Improving mental health services. There has been a huge increase in maternal mental health and child and adolescent mental health issues since the Covid 19 pandemic.
Management	• Development of mental health support for those with mental wellbeing difficulties presenting to primary care and being managed in primary care- support worker for self-help and counselling etc • Proactive management of anxiety and mental health - aiming to audit and address this growing unmet need within primary care. • Management plans. Social, spiritual, mental health, where and how you would like to die.
Access	• Improved access to mental well-being support • Mental health provision • Availability of mental health services for adults
Covid-19	• The impact of isolation to people's mental wellbeing during Covid • Deterioration in the mental health of people with Autism and learning difficulties during Covid
MDT	• Issue - lack of AHP particularly OT in primary care. Patients with mental health problems or complex comorbidity who do not meet the criteria for secondary care services cannot access OT services until they become very unwell. Goes against early intervention. • Why there are not more funded training places for people to deliver psychological interventions, i.e. psychologists, when demand greatly outweighs number of spaces currently available, and waiting lists are enormous.
Remote consultations	• Mental health services, particularly remote access
Self-care	• Eating well for your mental health
Early intervention	• Early access to mental health services in the community
Medication	• Inappropriately long durations of antidepressants
Carers	• The impact on the mental health of unpaid carers. Who is caring for the carers? What percentage of carers die before the cared for?
Equity	• The effect on the mental health of people who rely on charities to do their weekly shop

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Theme 1 'Disease and illness' sub-theme 'Covid-19' examples

Topics	Suggestion examples
Management	• Post Covid what the primary care consulting model will look like and how patients will be triaged in the future with potential infections • Long Covid and its issues for patients- what should services look like to support these patients? • Interventions in the community for post-Covid care IT - suggested assessments or interventions especially managing risk etc.
Lived experience	• Living with long Covid' • Post Covid symptoms – long-term recovery and support
Mental health	• Long term effects of Covid-19 on anxiety, depression, especially in young people • Mental health - impact of Covid on patients
Vaccination	• Long term side effects of Covid immunisation and the overall effect – how often will we need a vaccine and what's the longevity of the antibodies?

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Theme 1 'Disease and illness' sub-theme 'long-term conditions' examples

Topics	Suggestion examples
Management	• Management of long-term conditions • Disparity over how we deliver long term condition management and how that affects outcomes • Long term condition monitoring, does it improve morbidity and mortality? If so, for which conditions and what is optimum review interval and requirements'
Self-care	• Self-care of long-term conditions • Supporting patients living with long term conditions to take control of them with support from health care professionals
Remote consultations	• Remote consultant in long term condition management • Use of remote consultation on management of long-term chronic conditions as this group have a high DNA rate for face to face appointments
Prevention	• Primary prevention of long-term conditions. What would really work in the real world

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Theme 1 'Disease and illness' sub-theme 'obesity' examples

Topics	Examples
Prevention	• Better resources and treatments for prevention of obesity, once a patient has gained significant weight very difficult to remove and sustain.
Management	• Weight management/exercise • Obesity management strategies that are accessible for all

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Theme 1 'Disease and illness' sub-theme 'diabetes' examples

Topics	Examples
Prevention	• Diabetes and Obesity at all ages. More needs to be done about healthy eating and life style • Type 2 Diabetes - lifestyle management & prevention of disease or disease progression
Medication	• Cost benefits of GLP-1 receptor activators • Effects of lifestyle v drugs for Diabetes and CV disease and how to effectively deliver these
Lived experience	• Pre-diabetes and progression to type 2 diabetes and the patients experience and what they feel could have been done differently

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Theme 1 'Disease and illness' sub-theme 'dementia' examples

Topics	Examples
Management	• Dementia service / resource • Alternatives to 24hr large group residential settings vs group houses or entire dementia communities to allow safeguarding and independence
Lived experience	• Experience of persons with Dementia / L Disability in Inpatient acute care
Early intervention	• Implementation of OT services for early intervention for people with a dementia diagnosis • More timely diagnosis and access to dementia support. Dementia assessment and treatment to be separate from Mental Health services.
Carers	• Support for carers

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Theme 1 'Disease and illness' sub-theme 'frailty' examples

Topics	Examples
Management	• With an ageing population, a continued long-term strategy to address falls and fragility from cradle to grave • Approaches to frailty and last-years-of-life trajectories.
Mental health	• Impact of COVID/Isolation on mental health within the frail elderly population
Early intervention	• Early intervention for prevention in frailty
Lived experience	• Frailty of people living in own homes

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Theme 1 'Disease and illness' sub-theme 'addiction' examples

Topics	Examples
Management	• The role of Occupational Therapy within addiction, recovery and treatment teams
Medication	• Supporting people with alcohol and drug issues and polypharmacy
Lived experience	• Recovery from Addictions
Mental health	• Mental health services including drug and alcohol and children's services.
Early intervention	• The effect of early intervention (beyond Brief Intervention) on those identified with harmful drinking levels - preventing progress onto Hazardous drinking

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Theme 2 'Access' sub-theme 'availability and presence of services' examples

Topics	Examples
Provision	• Primary care access to psychological therapies and counselling Access to primary care services • How to build in sustainable service developments, particularly that can become community assets • Management of mental health and service availability
Care closer to home	• Access to services in the community/ more funding for community-based hubs • Transfer of services to primary care so that care can be delivered closer to patients' homes, do centralised services such as care and treatment services improve patient care? • Impacts on rural communities in accessing healthcare with redesign to hub healthcare

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Theme 2 'Access' sub-theme 'utilisation and service barriers' examples

Topics	Examples
Accessing healthcare professionals	• Access to nurse and GP appointments • Easy access for patients to GPs and other health professionals. Some may find it difficult to get appointments • Easier access to Medical Professionals' 'Patient access to the wider multidisciplinary team and breaking down barriers that are stopping this • Patient access to GP face to face appointments
Organisational barriers	• How to improve harder to reach patients accessing health services • Far better transport access to hospitals, either public or NHS
Waiting times	• Waiting times • Quicker access to primary care input to prevent escalation to secondary care services • What impact does a 2 year waiting list for psychological therapy have on mental health patients? • Impact of reduced time with the GP and longer waiting times on health outcomes
Patient understanding and expectations	• 'First contact physio service- need to improve patient understanding • Access to services - how to reduce inappropriate demand to improve available provision
Out of hours	• 7 day access to GP surgeries
Accessing during pandemic	• Impact of access challenges in immediate phase 1 of Covid on diagnosis of chronic conditions e.g. depression
Health literacy	• Addressing health literacy to improve outcomes

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Theme 2 'Access' sub-theme 'relevance and effectiveness of services' examples

Topics	Examples
Right service	• How mental health services are meeting the needs of patients within primary care • How Primary care become more responsive to the needs of the community • Effects of 'long Covid' on patients and access to effective treatment • Evaluation of impact of changes to patient engagement with GP practices (including different models, like care navigation, GP first triaging etc
Right time	• Access to early intervention on Mental Health concerns before they worsen • Triage to improve access to the right the person at the right time • How can we improve care for the housebound (who now often end up with reactive care from random professionals

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Theme 2 'Access' sub-theme 'equity' examples

Topics	Examples
Access for all	• Ensuring that services are accessible, acceptable, available and high quality, in line with a rights-based approach to ensuring that services support our shared right to the highest attainable standard of health • Unwarranted variation in care and medicines use across Scotland
Rurality	• The numbers of people living rurally, with no access to a car and miles from the nearest GP practice and the effect on their mental and physical health
Deprivation	• Communication poverty to improve accessibility, participation and citizenship

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Theme 3 'workforce' sub-theme examples

Sub-theme	Examples
Recruitment and retention	• Encourage GPs in primary care • Staff shortages in district nursing
Training and development	• Sharing of best practice and protocols for routine work • Sensory awareness and communication training for all primary care service staff
Workload	• Looking at pay/ employment rights/ annual leave of all practice nurses across Scotland and standardising it • The patient contact workload of GPs and impact on GP workforce and safety
Mental health	• Supporting staff's wellbeing when working from home • Burnout in the primary care workforce
GMS contract	• Impact of the 2018 GP contract

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Theme 4 'multi-disciplinary team' examples

Theme	Examples
MDT	• Added value of MDT in primary care? • Primary care is becoming more of an MDT; patient perspectives on this? • Effectiveness of nurse-led clinics • Unique contribution of occupational therapy service provision in early intervention for prevention model of service delivery within MDT in primary care setting • What is the role of the General Practice Nurse in 2030?

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Theme 5 'Integration' sub-theme examples

Sub-theme	Examples
Multi-agency working and collaboration	• Links with primary care and community rehabilitation teams • Impact of care at home through multi- agencies versus controlled agency commitment • Prioritisation in the context of health and social care need (not just health need) • Inclusive Communication Strategy across all primary care services
Continuity of care	• How Primary care can ensure continuity of care between themselves and the patient • Tools to measure continuity of care reliably
Social prescribing	• How to ensure the majority GPs to actively promote and utilise social prescribing • The extent to which community link workers in primary care practices are making measurable differences to patients' wellbeing and to health inequalities

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Theme 6 'health inequalities' examples

Theme	Examples
Health inequalities	• What measurable impact will primary care make on health inequalities across Scotland over the next 5 years?
Deprivation	• Poverty and the impact this has on health and wellbeing

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BMJ Open

A survey to identify research priorities for primary care in Scotland during and following the Covid-19 pandemic

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2021-056817.R2
Article Type:	Original research
Date Submitted by the Author:	01-Apr-2022
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Primary Subject Heading:	General practice / Family practice
Secondary Subject Heading:	Evidence based practice, Health policy, Health services research
Keywords:	PRIMARY CARE, QUALITATIVE RESEARCH, Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT

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TITLE

A survey to identify research priorities for primary care in Scotland during and following the Covid-19 pandemic

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ABSTRACT (290 words)

Objectives: To identify research priorities for primary care in Scotland following the Covid-19 pandemic.

Design: Modified James Lind Alliance methodology; respondents completed an on-line survey to make research suggestions and rank research themes in order of priority.

Setting: Scotland primary care

Participants: Healthcare professionals in primary care in Scotland and members of primary care Patient and Public Involvement (PPI) groups. 512 respondents provided research suggestions; 8% (n=40) did not work in health or social care; of those who did work, 68.8% worked in primary care, 16.3% community care, 11.7% secondary care, 4.5% third sector, 4.2% university (respondents could select multiple options). Of those respondents who identified as healthcare professionals, 33% were in nursing and midwifery professions, 25% were in Allied Health Professions (of whom, 45% were occupational therapists and 35% were physiotherapists), 20% were in the medical profession and 10% were in the pharmacy profession.

Main outcomes: Suggestions for research for primary care made by respondents were categorised into themes and sub-themes by researchers and ranked in order of priority by respondents.

Results: There were 1,274 research suggestions which were categorised under 12 themes and 30 sub-themes. The following five themes received the most suggestions for research: disease and illness (n=461 suggestions) access (n=202), workforce (n=164), MDT (n=143) and integration (n=108). One hundred and three (20%) respondents to the survey participated in ranking the list of 12 themes in order of research priority. The five most highly ranked research priorities were: disease and illness, health inequalities, access, workforce, and multi-disciplinary teams. The disease and illness theme had the greatest number of suggestions for research and was scored the most highly in the ranking exercise. The sub-theme ranked as the most important research priority in the disease and illness theme was 'mental health'.

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Conclusions: The themes and sub-themes identified in this study should inform research funders so that the direction of primary healthcare is informed by evidence.

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Strengths and limitations of this study

- A transparent and systematic Delphi approach was used to identify research priorities.
- The methods used provide a shared understanding of research priorities for primary care among nurses, pharmacists, Allied Health Professionals and medical professionals and PPI group members.
- We do not know how many healthcare professionals received the survey which means that we are unable to report a response rate; however, this study included fifty-four key partner organisations representing the range of primary care professions.
- We did not conduct a literature search to assess gaps in evidence relating to the research priorities.

Word count 3,195

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INTRODUCTION

The Covid-19 pandemic has had a significant impact on primary care[1-3] and so it is timely to set research priorities in order to support recovery. Primary care is the foundation of equitable and affordable healthcare,[4] especially in countries with universal coverage and a National Health Service (NHS) as in the United Kingdom (UK).[5] Scotland, as a devolved nation, is responsible for the funding and planning of its healthcare system with high quality primary care at the heart of its vision.[6] High quality primary care needs to be underpinned by high-quality research and evaluation.[7] Primary care is usually a person's first point of contact with the NHS[8] and it is where most patient contacts occur.[6] In this study, we adopted the following definition of primary care that has been agreed by a range of professional organisations in Scotland:

> "Primary care is provided by generalist health professionals, working together in multidisciplinary and multiagency networks across sectors, with access to the expertise of specialist colleagues. All primary care professionals work flexibly using local knowledge, clinical expertise and a continuously supportive and enabling relationship with the person to make shared decisions about their care and help them to manage their own health and wellbeing".[9]

Vertical (i.e. disease-specific) approaches to healthcare have been effective at reducing morbidity and mortality from specific conditions but have been criticized for detrimentally affecting the resources available to, and capacity of local primary care.[10] Research priorities set from a generalist and multi-professional perspective are also important and of value to patients and carers.[11-14] The high and increasing prevalence of multimorbidity associated with population ageing means that there is an increasing need for care which focusses on supporting people with multiple conditions.[15] Hence, there is a need to set both vertical (disease) and horizontal (generalist primary care) research

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priorities in order to guide research investment and direct resource allocation that will ultimately provide a robust evidence-base to underpin the development and delivery of primary care.

A number of previously published studies have identified primary care research priorities and the reach of these studies has varied with research priorities variously being developed internationally,[16] in low and middle income countries,[17] in the European Union,[18] or in single countries.[19] An argument for setting research priorities in one country, or a cluster of similar countries is because the challenges faced by primary care in different countries vary due to factors such as population characteristics (for example, an ageing population), diverse social cultures and norms, and different healthcare systems (for example, public and private healthcare systems).[18] Research priorities identified in several previous research prioritisation exercises include how primary care should be financed, organised and staffed,[16-20] the importance of implementation and translation of knowledge and evidence into primary care,[16 19] addressing multimorbidity,[16 19 20] promoting health equity,[16 19] promoting healthy behaviours in the population,[16 19] universal health coverage and health access,[16 17] digital delivery of primary care,[16 19] and the involvement of patients in the design and delivery of primary care. [16 19]

The aim of this study was to identify primary care research priorities in Scotland and set a research direction that will be relevant for patients, carers and generalist healthcare professionals in the aftermath of the coronavirus pandemic. This is the first comprehensive, generalist health professional project of primary care research priorities since the 2020 onset of the coronavirus pandemic. It is designed to strengthen future evidence for primary care to improve health outcomes.

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METHODS

This study adapted the James Lind Alliance (JLA) methodology.[21] The Steering Group for the project was the Scottish School of Primary Care (SSPC) Executive (http://www.sspc.ac.uk), which included an individual from a primary care Patient and Public Involvement (PPI) group, clinical academics and primary care researchers from Scottish universities. The following steps were taken to deliver the project:

Step 1&2: Identifying key partners and raising awareness of the study

'Key partner' organisations were identified through a process of peer knowledge and consultation, and through the Steering Group members' networks. Fifty-four key partner organisation agreed to participate by advertising the project and circulating the link to the survey to their members (Supplementary File 1: Key Partners).

Step 3: Identifying research priorities

The Steering Group administered an online survey via the key partner organisations for respondents to identify an initial set of research priorities (Supplementary File 2: Research priorities Survey). Healthcare professionals in primary care in Scotland were eligible to participate in the identification and prioritisation of research for primary care. Members of primary care PPI groups were also invited, including members of the National Research Scotland Primary Care PPI group. A period of three months was given to complete the survey (4th December 2020 – 1st March 2021). Responses were solicited with the following open-ended query that was used in a previous international JLA primary care research priorities project: "Please suggest up to three important primary care research questions" [16]. Responses were anonymous (no names were requested during the survey). Respondents were asked to provide an email if they were willing to participate in subsequent steps of the project, but these emails were stored separately from the submitted priorities. Results were downloaded from Online Survey to an Excel spreadsheet for the purposes of analysis in Step 4.

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Step 4: Analysis and identifying research themes and sub-themes

The submissions of all respondents were analysed collectively. Suggestions for research by respondents were grouped into themes and sub-themes by two members of the Steering Group (GH, FG), with the theoretical framework developed iteratively over several meetings including involvement of a third member of the group (SM) to resolve disagreements. Suggestions for research were allowed to be categorised under more than one theme. If a group of suggestions on the same topic totalled <1 percent (i.e. ≤12 suggestions) of the total number of research suggestions then a theme was not created. Sub-themes were identified within a theme when approximately ≥10% of suggestions were on a similar topic. Theme and sub-theme names were chosen from current policy and literature for example, sub-themes for the theme 'access' were drawn from a published definition of 'access' which included provision and availability of primary care services, equity of access, people's use of services and barriers to getting access as well as the dimension of effectiveness of using the service.[22]

The submissions of the sub-group who were not health and social care professionals (n=40) were included in the above exercise and also analysed separately to determine if there were any themes that were unique to this group.

Step 5: Ranking themes and research prioritisation

The aim of the final stage of the priority setting process was to rank the primary care research themes in order of priority. The respondents in Step 3 who wished to participate in this step were invited by email to rank the list of the summary research themes and sub-themes in order of priority. This exercise was done using an online survey, which was open for 1 month. Respondents

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were asked to rank 12 research themes that had been identified in Step 4 in order of priority, and to rank all sub-themes.

Patient and Public Involvement and Engagement

Several meetings between GH and the National Research Scotland Primary Care Public Involvement Group were held so that patients could contribute towards developing the protocol for this study. This group was also a key partner.

Ethical approval

Independent advice was sought from NHS Grampian Research Ethics Committee and University of Highlands and Islands Research Ethics Committee, who both advised that the project did not require research ethics review because the study was identifying research priorities and not conducting the research.

RESULTS

Respondent characteristics

There were 512 respondents. Eight percent (n=40) of respondent did not work in health or social care and therefore for the purposes of this study were regarded as patients, carers and members of the general public. Of those who did work, 68.8% worked in primary care, 16.3% community care, 11.7% secondary care, 4.5% third sector, 4.2% university (respondents could select multiple options for place of work). Table 1 shows the health and social care professions of respondents (n=472).

Table 1: Health and social care professions of respondents

Profession	N = 472 (%)

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Allied health profession regulated by Health and Care Profession	120 (25.4%)
Dentistry regulated by General Dental Council	5 (11%)
Medicine regulated by General Medical Council	95 (20.1%)
Nursing or Midwifery regulated by Nursing & Midwifery Council	157 (33.3%)
Pharmacy regulated by General Pharmaceutical Council	49 (10.4%)
Social work regulated by Scottish Social Services Council	2 (0.4%)
Other	44 (9.3%)

Of those respondents who were healthcare professionals, 33% were in nursing and midwifery professions regulated by the Nursing and Midwifery Council, 25% in Allied Health Professions regulated by the Health and Care Profession Council (of whom, 45% were occupational therapists and 35% were physiotherapists), 20% were in the medical profession regulated by the General Medical Council and 10% were in the pharmacy profession regulated by the General Pharmaceutical Council.

Research themes and sub-themes

The total number of research suggestions was 1,274. Research suggestions were categorised under 12 themes and 30 sub-themes (Table 2). The 12 themes and their associated sub-themes are positioned in order of the quantity of suggestions for research. Five themes had over 100 suggestions for research; these were 'disease and illness', 'access', 'workforce', 'multidisciplinary teams' and 'integration'. Hence, based on the number of suggestions for research, these are the top five priorities for research.

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Table 2: Themes and associated sub-themes in order of the quantity of research suggestions that were categorised under each theme and sub-theme (n=512 respondents)

Theme	Number[a]	Sub-themes	Number[a]
Disease and illness	461	Mental health	168
		Covid-19	58
		Long-term conditions	42
		Obesity	27
		Diabetes	18
		Dementia	16
		Frailty	14
		Addiction	14
Access	202	Availability and presence of services	72
		Utilisation of services and barriers	61
		Relevance & effectiveness of services	43
		Equity	26
Workforce	164	Recruitment and retention	58
		Training and development	54
		Workload	31
		Mental health	22
		GMS contract	11
Multi-disciplinary teams (MDT)	143	-	-
Integration	108	Multi-agency working & collaboration	74
		Social prescribing	20
		Continuity of care	14
Digital healthcare	96	Remote consultations	56
		Remote care	23
		IT systems	12
		Telephone triage	5
Self-care	84	Lifestyle	44
Primary / secondary care interface	62	Communication	9
		Continuity of care	9
Medications	55	-	-
Health inequalities	30	Deprivation	15
Carers	19	-	-
Patient involvement	13	Research	7
		Care	6

a. number of research suggestions categorised under a theme and sub-theme. Not all suggestions made by respondents were categorised under a theme or sub-theme.

The theme with the most suggestions for research was 'disease and illness'; the associated sub-themes indicate multiple long-term conditions. The sub-theme with the most suggestions for

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research under this theme was 'mental health'. The theme with the second most suggestions for research was 'access' and included suggestions about the availability of primary care services, utilisation of these services and barriers to access, the relevance and effectiveness of these services and equity of access. 'Workforce' was the theme that had the third most suggestions for research and included suggestions about recruitment and retention of primary care staff, training and development, workload, staff mental health, and GMS Contract. 'Multi-disciplinary teams' (MDT) was the theme that contained the fourth most suggestions for research. Twenty-eight percent of suggestions about MDTs did not specifically refer to a particular profession, 23% referred to nurses, 17% occupational therapists, 13% Allied Health Professions, 8% pharmacists, 4% physiotherapists and 3% psychologists. Forty-five percent of pharmacists (n=22) provided a suggestion categorised under the theme MDT, followed by 42% (n=51) of AHPs, 23% (n=22) of medical professionals, 22% (n=35) of nurses, and 20% (n=1) of dentists. 'Integration' was the theme that had the fifth most suggestions for research; associated sub-themes were multi-agency working and collaboration, social prescribing and continuity of care. Examples of research suggestions for each theme can be found in Supplementary File 3.

Figure 1 shows the themes of respondents who were not a health and social care professional (n=40). It shows that most research suggestions of this sub-group were categorised under the themes 'disease and illness' and 'access.' These were the themes with the highest number of research suggestions in the total group of respondents. The theme 'integration' had the third highest number of research suggestions and the theme 'self-care' had the fourth highest number of suggestions for research in this sub-group whereas these themes were fifth and seventh in the total group of respondents.

Insert Figure 1 here

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Ranking of research themes and sub-themes

One hundred and three (20%) respondents to the survey participated in ranking the list of 12 themes in order of research priority (Table 3). The five most highly ranked themes were as follows: 19.4% of respondents chose 'disease and illness', 17.4% chose 'health inequalities', 14.5% chose 'access', 12.6% chose 'workforce' and 12.6% chose 'multi-disciplinary team' as their number one top research priority. Hence, based on this ranking exercise, these are the top five priorities for research.

Table 3: Themes ranked as the number one top research priority (n=103 respondents)

Theme	Number of respondents ranking as top research priority
Disease and illness	20
Health inequalities	18
Access	15
Workforce	13
Multidisciplinary teams	13
Integration	6
Primary / secondary care interface	5
Digital healthcare	4
Self-care	4
Patient involvement	4
Medications	1
Care	0

Within the most highly ranked theme 'disease and illness', eight sub-themes were ranked. 'Mental health' was selected as the top priority by 37.9% of respondents followed by 23% of respondents choosing 'long-term conditions' as their top research priority under this theme. Four sub-themes were ranked in order of priority under the 'access' theme. Thirty-seven percent of respondents chose 'availability and presence of primary care services' as their top priority for research under this theme followed by 25% of respondents selecting 'relevance and effectiveness'. Four sub-themes were also ranked in order of priority within the 'workforce' theme. Twenty-nine percent of respondents chose 'recruitment and retention' as their top priority for research under this theme, followed by 23% of respondents selecting 'workload'. There was only one sub-theme identified

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during the survey for the main theme 'health inequalities' and no sub-themes for 'multidisciplinary teams' and so we did not ask respondents to conduct any further ranking under these themes. No sub-group analysis was conducted because we did not know which respondents (e.g. if they worked in health and social care) from the survey participated in the ranking exercise.

DISCUSSION

The study illustrates the quantity and breadth of research topics suggested primarily by primary care healthcare professionals. The study highlights that there are some differences between the themes with the greatest number of suggestions for research (Table 2) and the themes scored highly in the ranking exercise (Table 3); we therefore present both as a basis for research prioritization. The ranking of research themes in order of research priority identified the following top five priorities: 'disease and illness', 'access', 'workforce', 'multi-disciplinary teams' and 'health Inequalities'. The theme 'integration' attracted many suggestions for research by respondents although only 6% of respondents ranked it as their number one priority for research in the ranking exercise. The theme 'health inequalities' was highly ranked although this theme attracted relatively few suggestions for research compared with other themes that made it into the top five priorities for research. Why the theme 'health inequalities' attracted relatively few suggestions for research could be a consequence of having a much smaller number of respondents participating in the ranking exercise compared to the number of respondents involved in providing suggestions for research (103 *vs.* 512) or it could be that people think and choose differently when given a pre-specified list of themes to rank in order of research priority.

The study shows that the two top priorities for research – 'disease and illness' and 'access' - for the total group of respondents were also the top two priorities for research when the sub-group of respondents who did not work in health and social care were analysed separately. However, there were some differences in the number of research suggestions for other themes, which highlights

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that research priorities may vary depending on which groups of the population are involved in the prioritisation exercise.

The study shows that priorities for research may vary by profession. We show for instance, that a higher proportion of respondents in the pharmacy profession and AHPs made suggestions for research about MDTs compared to medical professionals and nurses. However, a strength of this study is that it presents priorities for research identified across a wide range of professions.

The most highly ranked theme was 'disease and illness' and its sub-themes include the most common conditions treated in primary care, most of which are long-term conditions. For all the conditions listed, including mental health problems, it is more common for people to have multimorbidity (two or more conditions) than the single condition alone.[15] What the suggestions for research categorised under this theme represent is recognition that the effective management in primary care of long-term conditions, either as a single chronic condition or multimorbidity, is going to be crucial for the nation's health. This focus on long-term conditions represents a shift in focus in research priorities for primary care. In a study conducted just over twenty years ago in Scotland, a key research priority for primary care was acute illness.[23]

Not surprisingly, Covid-19 was one of the conditions recommended by respondents for research because the study took place during the pandemic. Whether 'long-Covid' becomes classified as a new long-term condition is yet to be seen but research about the prevalence, persistence, management and long-term consequences of Covid-19 in primary care will be important to policy and practice in the foreseeable future. It is perhaps surprising that Covid-19 vaccination development, or at least its delivery in primary care, did not feature as a prominent suggestion for research since the first vaccine was given on 8th December 2020 in the UK and this survey was open between 4th December 2020 and 1st March 2021. A qualitative study exploring respondents'

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rationales for their suggestions for research would provide a much richer understanding of prioritization for research including reasons why certain topics are not prioritized.

Mental health is one of the top 10 most common conditions for seeking a GP or practice nurse consultation in primary care in Scotland[8] and was the topic that received the most suggestions for research. Again, mental health came to the fore during the global pandemic but was also a key public health concern and was identified as a research priority beforehand in countries such as, Scotland[23] and Australia.[19] During the Covid-19 pandemic a specific mental health concern has been highlighted, which is primary care staff stress and burnout and its potential effects on recruitment and retention.[24] The Health and Care (Staffing) (Scotland) Act 2019[25], provides a statutory basis for the provision of staffing, and highlights a duty by government to ensure that there are sufficient numbers of appropriate staffing for the provision of safe and high-quality health care, appropriate training, and the wellbeing of staff. The number of suggestions for research about the primary care workforce that were provided in this study imply that there may be perceived challenges in fulfilling this statutory duty. Staffing levels and work intensity also featured in a study identifying primary care patient safety research priorities in the UK that was published in 2019,[20] which suggests that workforce concerns are not just pertinent to the pandemic, although the pandemic may have exacerbated workforce challenges.

The previous research prioritization study in Scotland identified 'organisation of care' as a key theme and gave reducing inequalities in access to health care and reducing inequalities in health as examples under this theme. Twenty years on, access to primary care and health inequalities remain important research priorities. Health inequalities and access to services are two themes that have been identified as priorities in previous primary care research prioritisation exercises conducted in other countries, which implies that these are persistent concerns of global interest that merit further investigation.[16 17 19] Communication and coordination between care providers for instance, was a top

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10 research priority for primary care patient safety in the UK.[20] The study found that specific aspects of organisation of care were important research priorities, namely 'multi-disciplinary teams' and 'integration'. The 'Health and Social Care integration: progress review'[26] published in 2019 stated that the main reason for integration was so that care 'feels seamless' for patients. The vision for primary care in Scotland is for an enhanced and expanded multi-disciplinary community,[27] including general practitioners (GPs), alongside other health professionals such as, nurses, dentists, pharmacists, and Allied Health Professionals.[28] Vaccination services, pharmacotherapy services, community treatment and care services, urgent care services and additional professional services including acute musculoskeletal physiotherapy services, community mental health services and community link worker services were shifted from GP Contractors to the responsibility of other professions, albeit with GPs maintaining a professional role in these services in their capacity as expert medical generalists. Respondents suggestions for research and the ranking exercise reflect these policy shifts with recommendations for future research to include a focus on multi-disciplinary teams and integration. Health and social care organisations' response within the first six months of the Covid-19 pandemic required multi-disciplinary effort across organizational boundaries in Scotland.[29] Hence, future pandemics, as well as remobilisation and recovery phases of the current pandemic, may benefit from research to inform a multi-disciplinary approach to care.

Strengths and limitations

The main strengths of this study are that we used an established transparent and systematic approach to identifying research priorities and it involved a large number of healthcare professionals in Scotland. There were 512 respondents, of which 472 were health and social care professionals; this is the largest number of healthcare professionals engaging in a research prioritisation exercise about primary care research in Scotland and in other countries.[17 19 20] There are however a number of limitations. The study was reliant on the key partners advertising the survey and we do not know how many healthcare professionals received the survey, which means that we are unable to report a

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response rate. We did not explore respondents' reasons for proposing research suggestions or ranking themes. We were not able to describe which respondents (e.g. if they worked in health and social care and their profession) from the survey participated in the ranking exercise. We did not conduct a systematic literature review to assess gaps in evidence, which is often used in research prioritisation exercises to inform the final selection of top research priorities. Conducting robust literature reviews in relation to the five prioritised themes in future research would be valuable. The study was conducted during the second wave (September 2020 – April 2021)[30] of the pandemic when staff were already stretched to their limit by having to make major changes to their patterns of work. The research priorities highlighted by respondents must therefore be interpreted in this Scottish context. It is possible that a different set of priorities will emerge in the future as the impact of COVID-19 evolves.

Conclusion

There is a need to set research priorities in order to guide research investment and direct resource allocation that will ultimately provide a robust evidence-base to underpin the development and delivery of relevant, quality services for patients in primary care. The findings of this research prioritisation exercise can inform the future direction of research for primary care in Scotland. The themes identified in this study may be used by a broad range of stakeholder groups including; research funders, professional organisations, policy makers, charities and PPI groups to facilitate the setting of the course of research for primary care.

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Funding statement

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors. However, the Scottish School of Primary Care which led this study does receive a grant from the Scottish Government.

Competing interests

None declared.

Authors contribution

(1) GH, LP, SC, MM, MB, BG, SM conceived and designed the study; FG administered the survey; GH, FG, SM conducted the analysis and interpreted the data; (2) GH, LP, SC, MM, BG, SM, FG, MB drafted the manuscript and revised it critically for important intellectual content, and (3) gave final approval of the version of the manuscript to be published; (4) GH, LP, SC, MM, BG, SM, FG, MB agree to be accountable for all aspects of the work.

Data sharing statement

An anonymised dataset of all research suggestions is available upon reasonable request to the corresponding author.

Acknowledgements

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We wish to thank all survey respondents. We also wish to thank the National Research Scotland Primary Care Patient Public Involvement Group for their input.

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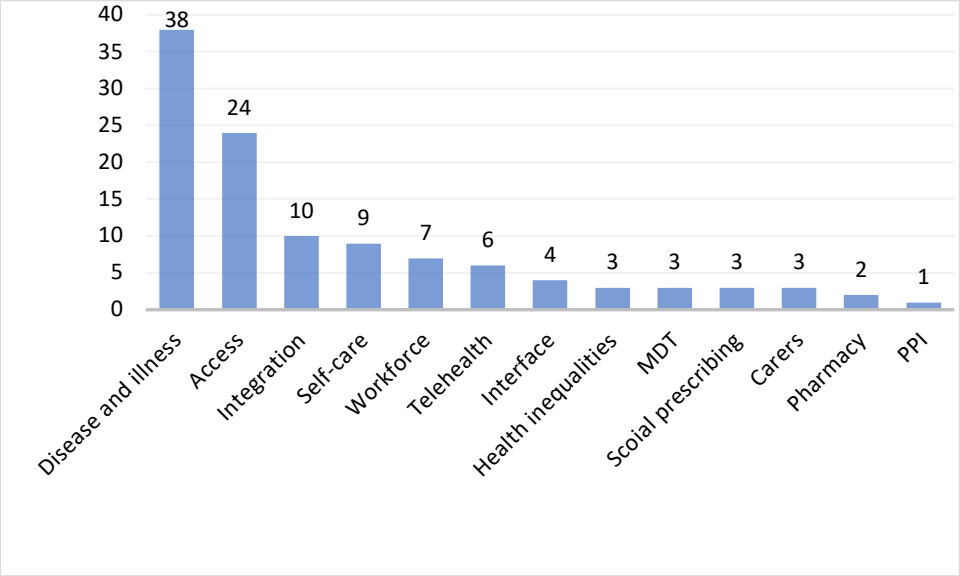
Figure 1: Themes of respondents who were not health and social care professionals (n=40 respondents)



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Key partners

Academy of Medical Royal Colleges and Faculties in Scotland (the Scottish Academy)
Advanced Practice Physiotherapy Network
Autism Network Scotland
Association of Advanced Practice Educators UK
BMA General Practitioners Committee Scotland
Chair of Directors of Pharmacy, NHS Boards
Chartered Society of Physiotherapy
Chest Heart & Stroke
Chief Nursing Officer
COSLA - Convention of Scottish Local Authorities
The Scottish Deep End Project
Defence Primary Health Care Scotland
Director of Postgraduate GP Education East
Edinburgh Community Health Forum
General Practice Nursing NHS Education Scotland
Healthcare Improvement Scotland
Health and Social Care Scotland (including Chief Officer Group and IJB Chairs & Vice Chairs Network)
International Foundation for Integrated Care (IFIC)
Mental Health Foundation
National Academy for Social Prescribing
NHS Board Chief Executives
NHS 24 Stakeholder Engagement and Insight
NHS National Services Scotland (NSS)
NRS Primary Care PPI
Penumbra -supporting mental health and wellbeing
PHC Lead Nurse at SG/Primary Care General Practice Nursing
Postgraduate Dean for Pharmacy NES
Programme Director Nursing NES
Public Health Scotland Primary Care Co-Cell Lead
Public Health Scotland
QNIS / Queen's Nursing Institute Scotland
RCGP Scotland
The Richmond Group of Charities, on behalf of the Taskforce on Multiple Conditions
RNIB Scotland
Royal College of General Practitioners
Royal College of Occupational Therapists
Royal College of Nursing Scotland
Royal Pharmaceutical Society (Scotland)
Scottish Ambulance Service, Medical Director
Scottish Community Development Centre/Community Health Exchange
Scottish Government - Division of Primary Care
Scotland's House of Care Programme
Scottish Physiotherapy Amputee Research Group (SPARG)
Scottish Practice Pharmacist and Prescribing Advisors group
Scottish Rural Health Partnership
Scottish Rural Medicine Collaborative
SIGN Scottish Intercollegiate Guidelines Network
Sight Action

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SPIRE clinical lead
The Association of Chartered Physiotherapists in Sports and Exercise Medicine
The Health and Social Care Alliance
The Society and College of Radiographers
Voluntary Health Scotland

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Scotland Primary Care Research Prioritisation Exercise survey

We are asking you to complete a short survey (3 questions that will take about 5 minutes to complete) that will ultimately lead to a Top Ten list of priorities for primary care research in Scotland. Before completing the survey please find some information about the study. Please only complete the survey if you live or work in Scotland. **Consent - Sorry you cannot proceed if you do not consent to take part.**

✱ *Required*

Before completing the survey please find some information about the study.

Scotland Primary Care Research Prioritisation Exercise

Our goal is to provide a clear direction for future primary care research so that it benefits the lives of individuals and families, and increases the amount of funding for the most important primary care research. We want to see research made even better with your input.

Purpose of the project

High-quality primary care is underpinned by high-quality research.

The disease COVID-19 that is caused by a new strain of coronavirus is likely to re-direct research priorities and shift research agendas in primary care.

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The aim of this project is to reach a consensus for primary care research priorities in Scotland where uncertainties remain and set a research direction that will be relevant for patients, carers and generalist healthcare professionals for the next 5 years.

It is designed to strengthen future evidence about primary care to improve health outcomes.

Who should do the survey?

Anyone living in Scotland who uses primary care services(patients and carers) or who are healthcare professionals working in Scotland will be eligible to participate in the identification and prioritisation of uncertainties.

Who is leading the project?

The project is led by the Scottish School of Primary Care. Our **key partners** are:

Academy of Medical Royal Colleges and Faculties in Scotland (the Scottish Academy)

Advanced Practice Physiotherapy Network

Autism Network Scotland

Association of Advanced Practice Educators UK

BMA General Practitioners Committee Scotland

Chair of Directors of Pharmacy

Chartered Society of Physiotherapy

Chest Heart & Stroke

Chief Nursing Officer

Community Pharmacy Scotland

COSLA – Convention of Scottish Local Authorities

Director of Postgraduate GP Education

Defence Primary Health Care Scotland

Edinburgh Community Health Forum

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General Practice Nursing – NHS Education Scotland

Healthcare Improvement Scotland

Health and Social Care Partnerships

Health and Social Care Scotland (including Chief Officer Group and The IJB Chairs & Vice Chairs Network)

International Foundation for Integrated Care (IFIC)

Mental Health Foundation

National Academy for Social Prescribing

NHS Chief Executives Board

NHS National Services Scotland (NSS)

NRS Primary Care Network PPI group

NRS Primary Care Network

Penumbra -supporting mental health and wellbeing

PHC Lead Nurse at SG/Primary Care General Practice Nursing

Postgraduate Dean for Pharmacy NES

Programme Director Nursing NES

Public Health Scotland Primary Care Co-Cell Lead

Public Health Scotland

Queen's Nursing Institute Scotland

RNIB Scotland

Royal College of General Practitioners

Royal College of Nursing Scotland

Royal College of Occupational Therapists

Royal Pharmaceutical Society (Scotland)

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Scottish Ambulance Service

Scottish Community Development Centre / Community Health Exchange

Scottish Government - Division of Primary Care

Scotland's House of Care Programme

Scottish Physiotherapy Amputee Research Group (SPARG)

Scottish Practice Pharmacist and Prescribing Advisors group

Scottish Rural Medicine Collaborative

Scottish Rural Health Partnership

SIGN – Scottish Intercollegiate Guidelines Network

Sight Action

SPIRE clinical lead

The Association of Chartered Physiotherapists in Sports and Exercise Medicine

The Health and Social Care Alliance

The Richmond Group of Charities, on behalf of the Taskforce on Multiple Conditions

The Scottish Deep End Project

The Society and College of Radiographers

Voluntary Health Scotland

Who is funding the project?

The Scottish Government financially supports the Scottish School of Primary Care.

What about confidentiality?

You can respond anonymously to this survey – you do not have to give your name or contact details. If you are a healthcare professional we will ask you what your occupation is.

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Who do I contact for further information about the study?

Prof Gill Hubbard is leading this project. She is a co-deputy director of the Scottish School of Primary Care.

She can be contacted at the following address or by email:

Prof Gill Hubbard, Department of Nursing, University of the Highlands and Islands, Highland Campus, Centre for Health Science, Old Perth Road, Inverness, IV2 3JH.

Email: gill.hubbard@uhi.ac.uk

What if I wish to complain about the study?

You can submit a written complaint about the study to: Prof Annetta Smith, Department of Nursing, University of the Highlands and Islands, Highland Campus, Centre for Health Science, Old Perth Road, Inverness, IV2 3JH.

Or you can contact her by telephone on: 01851 708250

Or you can email her at: Annetta.Smith@uhi.ac.uk

What will happen with the results?

Outputs will include academic papers, lay reports, infographics and social media feeds.

The project results could be used by funding bodies and decision-makers to influence the types of studies that are conducted by an array of researchers who are typically engaged in primary care research including general practitioners, nurses, pharmacists, psychologists, sociologists, anthropologists, statisticians, health economists, and health services researchers.

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Scotland Primary Care Research Prioritisation Exercise survey

Primary care is provided by generalist health professionals, working together in multidisciplinary and multiagency networks across sectors, with access to the expertise of specialist colleagues. All primary care professionals work flexibly using local knowledge, clinical expertise and a continuously supportive and enabling relationship with the person to make shared decisions about their care and help them to manage their own health and wellbeing.

About you: Where do you live most of the time?

Are you an unpaid carer? An upaid carer is defined as someone who is caring but does not have a contract or doing it as voluntary work.

Please select exactly 1 answer(s).

- ☐ Yes
- ☐ No

Do you consider yourself to have a long-term condition?

Please select exactly 1 answer(s).

- ☐ Yes
- ☐ No

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Do you work in health and / or social care?

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Which sector do you work in?

What sector do you work in? (please tick all that apply)

- ☐ Community Care
- ☐ Government (local or national)
- ☐ Primary Care
- ☐ Secondary Care
- ☐ Third Sector
- ☐ University
- ☐ Other

If you selected Other, please specify:

What is your main profession? (please select one)

- ◉ Allied health profession regulated by Health & Care Profession Council (Please write it down)
- ○ Dentistry regulated by General Dental Council
- ○ Medicine regulated by General Medical Council
- ○ Nursing or Midwifery regulated by Nursing & Midwifery Council
- ○ Pharmacy regulated by General Pharmaceutical Council
- ○ Social work regulated by Scottish Social Services Council
- ○ Other

If you selected 'Allied Health Profession' or 'Other', please specify:

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Research to Improve Primary Care

What topics, issues and concerns do you think are important to research to improve primary care for the next 5 years? Please suggest up to three (in any order)

Suggestion 1.

Suggestion 2.

Suggestion 3.

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Would you be willing to be involved in the next stage where you will be asked to rank a list of research questions in order of priority then please provide your email address:

Please provide email address:

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What happens next..

You have been directed here if you did not consent to take part in the survey OR you have now completed the survey.

What will happen with the results?

Outputs will include academic papers, lay reports, infographics and social media feeds.

The project results could be used by funding bodies and decision-makers to influence the types of studies that are conducted by an array of researchers who are typically engaged in primary care research including general practitioners, nurses, pharmacists, psychologists, sociologists, anthropologists, statisticians, health economists, and health services researchers.

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Final page

Thank you for taking part in the survey.

Key for selection options

1 - We are asking you to complete a short survey (3 questions that will take about 5 minutes to complete) that will ultimately lead to a Top Ten list of priorities for primary care research in Scotland. Before completing the survey please find some information about the study. Please only complete the survey if you live or work in Scotland. Consent - Sorry you cannot proceed if you do not consent to take part.

I consent to take part in the survey
I do not consent to take part

2 - About you: Where do you live most of the time?

Scotland
Not in Scotland

5 - Do you work in health and / or social care?

Yes
No

9 - Would you be willing to be involved in the next stage where you will be asked to rank a list of research questions in order of priority then please provide your email address:

Yes
No

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Theme 1 'Disease and illness' sub-theme 'mental health' examples

Topics	Suggestion examples
Children and young people	• Mental health services in children and adolescents • How can primary and secondary care better work together to care for children and young people with mental disorder, ranging from ADHD to anorexia nervosa. • Improving mental health services. There has been a huge increase in maternal mental health and child and adolescent mental health issues since the Covid 19 pandemic.
Management	• Development of mental health support for those with mental wellbeing difficulties presenting to primary care and being managed in primary care- support worker for self-help and counselling etc • Proactive management of anxiety and mental health - aiming to audit and address this growing unmet need within primary care. • Management plans. Social, spiritual, mental health, where and how you would like to die.
Access	• Improved access to mental well-being support • Mental health provision • Availability of mental health services for adults
Covid-19	• The impact of isolation to people's mental wellbeing during Covid • Deterioration in the mental health of people with Autism and learning difficulties during Covid
MDT	• Issue - lack of AHP particularly OT in primary care. Patients with mental health problems or complex comorbidity who do not meet the criteria for secondary care services cannot access OT services until they become very unwell. Goes against early intervention. • Why there are not more funded training places for people to deliver psychological interventions, i.e. psychologists, when demand greatly outweighs number of spaces currently available, and waiting lists are enormous.
Remote consultations	• Mental health services, particularly remote access
Self-care	• Eating well for your mental health
Early intervention	• Early access to mental health services in the community
Medication	• Inappropriately long durations of antidepressants
Carers	• The impact on the mental health of unpaid carers. Who is caring for the carers? What percentage of carers die before the cared for?
Equity	• The effect on the mental health of people who rely on charities to do their weekly shop

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Theme 1 'Disease and illness' sub-theme 'Covid-19' examples

Topics	Suggestion examples
Management	• Post Covid what the primary care consulting model will look like and how patients will be triaged in the future with potential infections • Long Covid and its issues for patients- what should services look like to support these patients? • Interventions in the community for post-Covid care IT - suggested assessments or interventions especially managing risk etc.
Lived experience	• Living with long Covid' • Post Covid symptoms – long-term recovery and support
Mental health	• Long term effects of Covid-19 on anxiety, depression, especially in young people • Mental health - impact of Covid on patients
Vaccination	• Long term side effects of Covid immunisation and the overall effect – how often will we need a vaccine and what's the longevity of the antibodies?

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Theme 1 'Disease and illness' sub-theme 'long-term conditions' examples

Topics	Suggestion examples
Management	• Management of long-term conditions • Disparity over how we deliver long term condition management and how that affects outcomes • Long term condition monitoring, does it improve morbidity and mortality? If so, for which conditions and what is optimum review interval and requirements'
Self-care	• Self-care of long-term conditions • Supporting patients living with long term conditions to take control of them with support from health care professionals
Remote consultations	• Remote consultant in long term condition management • Use of remote consultation on management of long-term chronic conditions as this group have a high DNA rate for face to face appointments
Prevention	• Primary prevention of long-term conditions. What would really work in the real world

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Theme 1 'Disease and illness' sub-theme 'obesity' examples

Topics	Examples
Prevention	• Better resources and treatments for prevention of obesity, once a patient has gained significant weight very difficult to remove and sustain.
Management	• Weight management/exercise • Obesity management strategies that are accessible for all

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Theme 1 'Disease and illness' sub-theme 'diabetes' examples

Topics	Examples
Prevention	• Diabetes and Obesity at all ages. More needs to be done about healthy eating and life style • Type 2 Diabetes - lifestyle management & prevention of disease or disease progression
Medication	• Cost benefits of GLP-1 receptor activators • Effects of lifestyle v drugs for Diabetes and CV disease and how to effectively deliver these
Lived experience	• Pre-diabetes and progression to type 2 diabetes and the patients experience and what they feel could have been done differently

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Theme 1 'Disease and illness' sub-theme 'dementia' examples

Topics	Examples
Management	• Dementia service / resource • Alternatives to 24hr large group residential settings vs group houses or entire dementia communities to allow safeguarding and independence
Lived experience	• Experience of persons with Dementia / L Disability in Inpatient acute care
Early intervention	• Implementation of OT services for early intervention for people with a dementia diagnosis • More timely diagnosis and access to dementia support. Dementia assessment and treatment to be separate from Mental Health services.
Carers	• Support for carers

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Theme 1 'Disease and illness' sub-theme 'frailty' examples

Topics	Examples
Management	• With an ageing population, a continued long-term strategy to address falls and fragility from cradle to grave • Approaches to frailty and last-years-of-life trajectories.
Mental health	• Impact of COVID/Isolation on mental health within the frail elderly population
Early intervention	• Early intervention for prevention in frailty
Lived experience	• Frailty of people living in own homes

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Theme 1 'Disease and illness' sub-theme 'addiction' examples

Topics	Examples
Management	• The role of Occupational Therapy within addiction, recovery and treatment teams
Medication	• Supporting people with alcohol and drug issues and polypharmacy
Lived experience	• Recovery from Addictions
Mental health	• Mental health services including drug and alcohol and children's services.
Early intervention	• The effect of early intervention (beyond Brief Intervention) on those identified with harmful drinking levels - preventing progress onto Hazardous drinking

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Theme 2 'Access' sub-theme 'availability and presence of services' examples

Topics	Examples
Provision	• Primary care access to psychological therapies and counselling Access to primary care services • How to build in sustainable service developments, particularly that can become community assets • Management of mental health and service availability
Care closer to home	• Access to services in the community/ more funding for community-based hubs • Transfer of services to primary care so that care can be delivered closer to patients' homes, do centralised services such as care and treatment services improve patient care? • Impacts on rural communities in accessing healthcare with redesign to hub healthcare

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Theme 2 'Access' sub-theme 'utilisation and service barriers' examples

Topics	Examples
Accessing healthcare professionals	• Access to nurse and GP appointments • Easy access for patients to GPs and other health professionals. Some may find it difficult to get appointments • Easier access to Medical Professionals' 'Patient access to the wider multidisciplinary team and breaking down barriers that are stopping this • Patient access to GP face to face appointments
Organisational barriers	• How to improve harder to reach patients accessing health services • Far better transport access to hospitals, either public or NHS
Waiting times	• Waiting times • Quicker access to primary care input to prevent escalation to secondary care services • What impact does a 2 year waiting list for psychological therapy have on mental health patients? • Impact of reduced time with the GP and longer waiting times on health outcomes
Patient understanding and expectations	• 'First contact physio service- need to improve patient understanding • Access to services - how to reduce inappropriate demand to improve available provision
Out of hours	• 7 day access to GP surgeries
Accessing during pandemic	• Impact of access challenges in immediate phase 1 of Covid on diagnosis of chronic conditions e.g. depression
Health literacy	• Addressing health literacy to improve outcomes

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Theme 2 'Access' sub-theme 'relevance and effectiveness of services' examples

Topics	Examples
Right service	• How mental health services are meeting the needs of patients within primary care • How Primary care become more responsive to the needs of the community • Effects of 'long Covid' on patients and access to effective treatment • Evaluation of impact of changes to patient engagement with GP practices (including different models, like care navigation, GP first triaging etc
Right time	• Access to early intervention on Mental Health concerns before they worsen • Triage to improve access to the right the person at the right time • How can we improve care for the housebound (who now often end up with reactive care from random professionals

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Theme 2 'Access' sub-theme 'equity' examples

Topics	Examples
Access for all	• Ensuring that services are accessible, acceptable, available and high quality, in line with a rights-based approach to ensuring that services support our shared right to the highest attainable standard of health • Unwarranted variation in care and medicines use across Scotland
Rurality	• The numbers of people living rurally, with no access to a car and miles from the nearest GP practice and the effect on their mental and physical health
Deprivation	• Communication poverty to improve accessibility, participation and citizenship

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Theme 3 'workforce' sub-theme examples

Sub-theme	Examples
Recruitment and retention	• Encourage GPs in primary care • Staff shortages in district nursing
Training and development	• Sharing of best practice and protocols for routine work • Sensory awareness and communication training for all primary care service staff
Workload	• Looking at pay/ employment rights/ annual leave of all practice nurses across Scotland and standardising it • The patient contact workload of GPs and impact on GP workforce and safety
Mental health	• Supporting staff's wellbeing when working from home • Burnout in the primary care workforce
GMS contract	• Impact of the 2018 GP contract

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Theme 4 'multi-disciplinary team' examples

Theme	Examples
MDT	• Added value of MDT in primary care? • Primary care is becoming more of an MDT; patient perspectives on this? • Effectiveness of nurse-led clinics • Unique contribution of occupational therapy service provision in early intervention for prevention model of service delivery within MDT in primary care setting • What is the role of the General Practice Nurse in 2030?

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Theme 5 'Integration' sub-theme examples

Sub-theme	Examples
Multi-agency working and collaboration	• Links with primary care and community rehabilitation teams • Impact of care at home through multi- agencies versus controlled agency commitment • Prioritisation in the context of health and social care need (not just health need) • Inclusive Communication Strategy across all primary care services
Continuity of care	• How Primary care can ensure continuity of care between themselves and the patient • Tools to measure continuity of care reliably
Social prescribing	• How to ensure the majority GPs to actively promote and utilise social prescribing • The extent to which community link workers in primary care practices are making measurable differences to patients' wellbeing and to health inequalities

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Theme 6 'health inequalities' examples

Theme	Examples
Health inequalities	• What measurable impact will primary care make on health inequalities across Scotland over the next 5 years?
Deprivation	• Poverty and the impact this has on health and wellbeing

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STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	page
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	2
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants	7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	-
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	-
Bias	9	Describe any efforts to address potential sources of bias	-
Study size	10	Explain how the study size was arrived at	-
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	8
		(*b*) Describe any methods used to examine subgroups and interactions	8-
		(*c*) Explain how missing data were addressed	
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	-
		(*e*) Describe any sensitivity analyses	-
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9
		(b) Give reasons for non-participation at each stage	-
		(c) Consider use of a flow diagram	-
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9
		(b) Indicate number of participants with missing data for each variable of interest	-
Outcome data	15*	Report numbers of outcome events or summary measures	-
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	-

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		(*b*) Report category boundaries when continuous variables were categorized	-
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	-
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	-
Discussion			
Key results	18	Summarise key results with reference to study objectives	9-14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	17-18
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	14-17
Generalisability	21	Discuss the generalisability (external validity) of the study results	17
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	18

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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