

research



Reducing self-harm in Pakistani adolescents p 301



Trends in England's GP workforce p 302



Outcomes in non-participants in breast cancer screening p 304



Methylcobalamin for prevention of hand-foot syndrome p 306

ORIGINAL RESEARCH Multicentre, randomised controlled trial

Effectiveness of YCMAP (youth culturally adapted manual assisted problem solving) intervention in adolescents after self-harm in Pakistan

Husain N, Tofique S, Kiran T, et al

Cite this as: *BMJ* 2025;390:e083272

Find this at doi: 10.1136/bmj-2024-083272

Study question Does the YCMAP (youth culturally adapted manual assisted problem solving) intervention reduce repetition of self-harm at 12 months in adolescents in Pakistan compared with enhanced usual care?

Methods This multicentre, rater blind, parallel group, randomised controlled trial recruited adolescents aged 12-18 years with a recent history of self-harm identified at participating health centres in Karachi, Hyderabad, Lahore, Multan, and Rawalpindi between 5 November 2019 and 31 August 2021. Participants were allocated 1:1 to the YCMAP group (up to 10 individual sessions over three months, problem solving, and cognitive behavioural techniques) or enhanced treatment as usual (referral pathways plus standard clinical management). The primary outcome was any repeated self-harm at 12 months after randomisation assessed using the adapted suicide attempt self-injury interview. Secondary outcomes were psychological distress, hopelessness, suicidal

ideation, health related quality of life, and service satisfaction assessed at three, six, nine, and 12 months.

Study answer and limitations 684 adolescents (mean age 16 years; 53% female) were randomised to YCMAP (n=342) or enhanced treatment as usual (n=342). The YCMAP group had a significantly lower risk of self-harm repetition than the enhanced treatment as usual group at 12 months after randomisation (odds ratio 0.20, 95% confidence interval 0.06 to 0.70, P=0.006). YCMAP participants showed a statistically significant reduction in distress, hopelessness, and suicidal ideation at three months, but these differences were not statistically significant at 12 months. YCMAP participants also reported significantly better quality of life and satisfaction with services at three months, with these effects sustained at all follow-ups. Limitations include reliance on self-reported secondary outcomes and uncertain generalisability beyond urban Pakistan.

What this study adds The YCMAP intervention was shown to be beneficial in reducing self-harm repetition at 12 months among adolescents in Pakistan.

Funding, competing interests, and data sharing Funded by Medical Research Council, UK Department for International Development, and National Institute for Health and Care Research. No competing interests declared. Data available from corresponding author (nusrat.husain@manchester.ac.uk).

Study registration ClinicalTrials.gov NCT04131179 and ISRCTN registry ISRCTN57325925.

GP working patterns in England

ORIGINAL RESEARCH Repeat cross sectional study

Trends in the shortfall of English NHS general practice doctors

Pettigrew LM, Bharmal AV, AKLS, et al

Cite this as: *BMJ* 2025;390:e083978

Find this at doi: 10.1136/bmj-2024-083978

Study question How have trends in the numbers of licensed general practitioners (GPs) in England, compared with those working in NHS general practice, changed over time relative to population growth and relative to the specialist medical workforce in England?

Methods A repeat cross sectional study was conducted comparing numbers of GPs and specialist doctors recorded from three national data sources: General Medical Council (GMC) GP and specialist registers, NHS England GP Performers List, and NHS England's General Practice Workforce and NHS Workforce Statistics datasets.

Study answer and limitations Between 2015 and 2024, the gap between GMC licensed GPs and those working in NHS general practice widened. On average, for every five additional GMC licensed GPs, NHS general practice lost one full time equivalent GP each year. Consequently, the proportion of GMC licensed GPs not working in NHS

general practice increased from 27% (13 492) in 2015 to 34% (19 922) in 2024 by headcount and from 41% (20 210) to 52% (30 351) by full time equivalent GPs. The greatest discrepancies were among female GPs, younger GPs, UK qualified GPs in absolute terms, non-UK qualified GPs in relative terms, and GPs in London and the south east. This growing difference contrasts with trends among, largely hospital based, specialists (NHS consultants). By the end of 2024, after accounting for population growth, there were twice as many NHS patients for each full time equivalent NHS general practice GP (2260) than for a full time equivalent NHS consultant (1092). Data are lacking on the activities of GMC licensed GPs not working in NHS general practice.

What this study adds The study captures the attrition in the number of GPs working in NHS general practice compared with NHS consultants and considering population growth. New insights are provided into the characteristics of those GPs not working in NHS general practice but who maintain their licence to practise in England.

Funding, competing interests, and data sharing LMP is funded by a National Institute for Health and Care Research doctoral research fellowship. Authors LMP, SA, and LNA are general practitioners; AVB is a general practitioner trainee. See full paper on [bmj.com](https://www.bmj.com) for data sharing.

COMMENTARY Trends threaten government plans for the NHS

Problems with recruitment and retention of general practitioners (GPs) in England are long standing. Some causes are well understood: unsustainable workloads, increasing demands from patients, insufficient time to do justice to the job, and high administrative burden are cited by GPs as reasons to leave general practice or reduce working hours.¹ Poor methods for recording their working patterns mean that full time equivalent hours reported in national data likely underestimate GPs' true working hours.²

The study by Pettigrew and colleagues—the first to link three national sources of GP workforce data—found that the proportion of qualified GPs working in NHS general practice is falling.³ A particularly stark finding was that one in three GPs with a licence to practise in England was not working in NHS general practice. The study further suggested that most newly qualified GPs were not entering the NHS GP workforce or left soon after joining, and that the number of patients per NHS GP had risen by 15% between 2015 and 2024.

Becks Fisher
becks.fisher@nuffieldtrust.org.uk
See [bmj.com](https://www.bmj.com) for author details



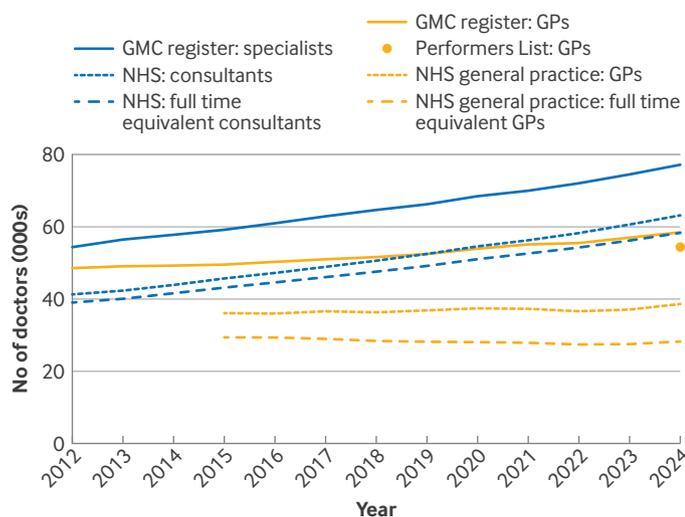
Falling GP participation is a major problem for patients and for politicians

Previous studies suggest that cutting back working hours helps GPs manage workload intensity, stress, and their mental health,⁴ but Pettigrew and colleagues' study highlights that some qualified GPs are working very minimally in NHS general practice, and many are not working in it at all. Recently, the ability of GPs to have "portfolio careers" (working part time in other roles alongside clinical general practice) has been seen as an appealing aspect of the job, and used to attract doctors

to careers in general practice. GPs have been encouraged to diversify their clinical practice by developing specialist skills to work alongside hospital consultants as so called GPs with extended roles. Leadership positions, firstly in clinical commissioning groups and more recently in primary care networks, have created opportunities outside clinical care. Many GPs will work outside the NHS, for example, in academia, industry, or medical education; some work in private general practice, on a part time basis, or not at all.

Less patient care

Falling GP participation is a major problem



Number of NHS patients for each general practitioner (GP) and specialist doctor (consultant) in England from the General Medical Council (GMC) GP and specialist registers, NHS England GP Performers List, and NHS England General Practice Workforce and NHS Workforce Statistics datasets (by headcount and full time equivalent GP or consultant)



STEFAN ROUSSEAU/PALAMY

for patients and for politicians. Poor access to general practice often tops the list of public concerns with the NHS, and the secretary of state for health and social care has promised improvement.^{5,6} The previous UK government hoped that increasing recruitment for other roles involving direct patient care in general practice would offset the decline in GP participation and tackle problems with access to care. However, despite more than 40 000 staff being recruited to these roles in England since 2019 (including pharmacists, physiotherapists, paramedics, and link workers) patients are adamant that it is GPs they want to see.^{7,8}

A flagship of the UK government's new 10 year health plan is the creation of a neighbourhood health service, bringing care out of hospitals and into communities, underpinned by a revitalised general practice.⁹ Delivering this plan and improving public satisfaction requires boosting the number of GPs working in NHS general practice—and increasing participation rates is key to that aim. But by drawing GPs out of consulting rooms to lead multidisciplinary teams and spearhead neighbourhood health, the plan could undermine the need to have more GPs delivering clinical care.

Pettigrew and colleagues highlight that better data would help to define the problem and identify solutions. No system is currently in place to track what qualified GPs are doing for work other than NHS general practice. While plenty of studies have identified factors pushing GPs out of general practice, few studies have explored factors attracting them to other roles. Competing narratives also need to be unpicked: dissatisfaction with pay has been identified as a factor pushing GPs out of NHS practice, but it is also possible that increasing GP income might allow more doctors to reduce their working hours.¹⁰ Gaining a better understanding of the factors shaping GPs' decisions would reduce the chances of future policies backfiring.

Turning tide

Patients and politicians do have reason to be hopeful. After years of decline, the number of full time equivalent fully qualified GPs has been rising since January 2025, driven by an increase in the number of GPs completing training.¹¹ The data are not as nuanced as the analysis by Pettigrew and colleagues, but offer hope that the tide may be turning. Recruiting

newly qualified GPs into NHS general practice and keeping them there should be a priority for the UK government, but this is not a straightforward task. On top of existing concerns, the massive expansion of non-GP clinicians, funded directly by government (ie, at no cost to GP practices) has changed the labour market. The BMA has warned that up to 1000 newly qualified GPs may be left without a job this summer, as cash limited general practices restrict recruitment and choose to use other clinical staff instead.¹²

While policy makers may argue that little can be done to control competing job options for GPs outside the NHS, ending the paradox of GPs being unable to get NHS work when more GPs are desperately needed must be prioritised. Ensuring that jobs exist for newly trained GPs is only part of the solution; the complex mix of factors driving one in three qualified GPs out of NHS general practice must be addressed together. The UK government has promised a long term workforce plan in the autumn, and Pettigrew and colleagues' research describes a problem that plan must solve.

Cite this as: *BMJ* 2025;390:r1886

Find the full version with references at <http://dx.doi.org/10.1136/bmj.r1886>



TRYGVEFINNELSEVALAWAY

Participation in early mammography screening

ORIGINAL RESEARCH Population based cohort study

First mammography screening participation and breast cancer incidence and mortality in the subsequent 25 years

Ma Z, He W, Zhang Y, et al

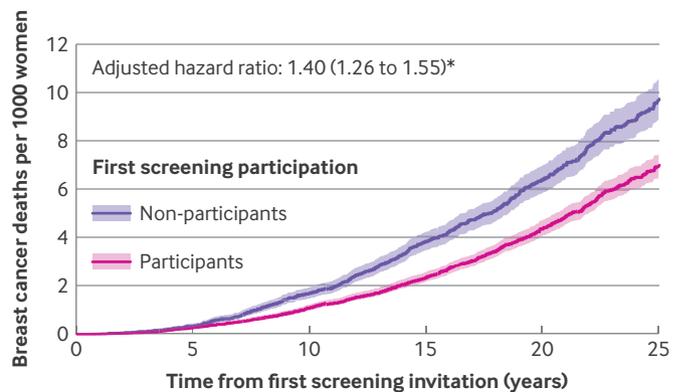
Cite this as: *BMJ* 2025;390:e085029

Find this at doi: 10.1136/bmj-2025-085029

Study question Do women who do not attend their first mammography screening invitation have a long term risk of poor screening adherence and breast cancer outcomes?

Methods This population based cohort study in Stockholm, Sweden, included 432 775 women first invited to the Swedish Mammography Screening Programme at age 40 or 50 between 1991 and 2020. They were followed until 2023, a follow-up period of up to 25 years. Using linked national registers, the study estimated long term adherence to screening, cumulative incidence of breast cancer, tumour characteristics, and breast cancer mortality by first screening participation.

Study answer and limitations Among women invited to their first mammography screening, 32.1% (n=138 760) did not participate. These non-participants were persistently less likely to attend subsequent screenings and were more likely to have symptom detected, advanced stage breast cancer diagnosed. Compared with participants, non-participants had higher odds of stage III (160 (4.1%) v 266 (2.9%) cases; odds ratio 1.53, 95% confidence interval (CI) 1.24 to 1.88) and stage IV cancer (150 (3.9%) v 105 (1.2%) cases; 3.61, 2.79 to 4.68). They also had higher 25 year breast cancer mortality (9.9 v 7.0 per 1000 women; adjusted hazard ratio 1.40, 95% CI 1.26 to 1.55), despite similar 25 year incidence (7.6% v 7.8%), suggesting delayed detection rather than increased risk. Limitations include potential residual confounding inherent to observational studies.



No at risk						
Non-participants	138 123	130 724	103 516	72 141	44 264	23 294
Participants	293 172	277 771	220 521	154 017	93 586	55 012

Breast cancer mortality up to 25 years after first screening invitation during 1991-2023, stratified by participation at first invited mammography screening.

*Estimates derived from Cox proportional hazard model, adjusted for age and calendar year of first screening participation, educational attainment, income, migration status, marital status, number of children, age of first birth, alcohol related disease, obesity related disease, Charlson comorbidity index, family history of cancer, and family history of breast cancer

What this study adds This study showed that non-participants at the first screening represent a large population at long term risk of dying from breast cancer, providing an opportunity for targeted interventions to improve screening adherence and thereby decrease mortality risk.

Funding, competing interests, and data sharing This work was mainly financed by the Swedish Research Council and the Swedish Cancer Society. No competing interests declared. Access to data can be requested from the relevant Swedish healthcare data holders.

Globally, one in 20 women will have a diagnosis of breast cancer in their lifetime, with an estimated 2.3 million new cases and 670 000 deaths in 2022.¹ The incidence is projected to increase by 38% to 3.2 million and the mortality to increase by 68% to 1.1 million by 2050, if the current trend continues.¹ Breast cancer was diagnosed at a later stage in about 40% of patients, which significantly contributed to breast cancer related deaths.^{2,3} Mammograms can detect breast cancer early, often before a lump can be felt, which improves the chances of successful treatment and survival. Mammography is reported to be associated with a 15% relative reduction in breast cancer mortality for women aged 40-74 years.⁴ However, debate continues about the long term benefits of mammography screening in public health and clinical practice.⁵⁻⁷ Concerns remain regarding overdiagnosis, false positive results, psychological distress, cumulative radiation exposure, and the extent to which population level survival benefits outweigh these harms. Thus, the balance of risks and benefits, as well as the appropriate screening intervals and target populations, remain important areas of ongoing evaluation and discussion.

In their study, Ma and colleagues constructed a large population cohort study design with 432 775 women in the Swedish Mammography Screening Programme, linking them to multiple Swedish national registers and following them up to 25 years.⁸ The authors present compelling evidence that women who did not attend their first screening were persistently less likely to participate in future screenings. These women were also more likely to have symptoms detected, advanced stage breast cancer diagnosed, and experienced significantly higher breast cancer mortality. This study, notable for its extended follow-up and robust cohort design, carries important practical implications for patients, clinicians, and health systems.

Lasting benefits

For patients, especially women approaching the recommended age for breast cancer screening,⁹ the message is clear: participating in early mammography



Population based public health interventions, such as mammography, save lives and should be a public health priority

screening can have a lasting benefit. This study supports the general recommendation of starting screening at the designated age (women between 40 and 75 years of age). Many women (32.1% in this report) decline or delay screening owing to lack of awareness or family history, fear of harms from screening, or misunderstanding of risks and benefits.¹⁰ This study highlights that the decision to attend that first appointment is far more than a short term health check—it is a long term investment in breast health and survival. The long term reduction in mortality should mitigate the fear of risk or potential overdiagnosis, at least in a population based mammography screening programme. Patients should discuss their individual risk factors, including family history and genetic predisposition, with their healthcare providers.

For clinicians discussing the potential benefits and drawbacks of mammography screening,¹¹ this study provides concrete evidence that initial screening reduces mortality, which should enable healthcare providers to move beyond short term cancer detection rates and instead emphasise the enduring long term effect on mortality during their interactions with patients. Clinicians should also be aware of any psychological and social barriers that may prevent women from attending their first screening. These include anxiety about the procedure, mistrust of medical

systems, cost, cultural beliefs, and logistical problems such as transportation or time off work.¹⁰ Understanding and overcoming these barriers can help to improve initial screening uptake and long term outcomes. Furthermore, clinicians should take a personalised approach when discussing screening with their patients. Personal risk factors, comorbidities, and patients' values should be considered to make a personalised and informed decision. This ensures that screening recommendations are tailored to each patient's unique health profile, even as this study reinforces the broader, population level benefits of early screening.

A public health priority

From a public health policy perspective, this study underscores the effectiveness of population based mammography screening programmes. Public health outreach campaigns, culturally competent education materials, and system level support that can increase the initial participation rates in mammography screening should be a public health priority.^{12,13} The findings also support maintaining public investment in mammography infrastructure, given that the mortality benefits extend for decades; even a modest increase in first round participation could yield substantial long term gains in population health.

Policy makers should also consider strategies to reduce inequalities in screening participation. Targeted interventions, supported by geospatial analytics that use local data and community input, are crucial for ensuring equitable access and outcomes for women of lower socioeconomic status or in minority groups or rural areas. Furthermore, programme evaluations should include both short term indicators, such as cancer detection rates or interval cancer rates, and long term mortality reductions as key measures of success.

Breast cancer screening is a decision point with lifelong consequences. Ensuring that women are informed, supported, and empowered to participate in their first screening should be a shared goal across the healthcare system. Population based public health interventions, such as mammography, save lives and should be a public health priority.

Cite this as: *BMJ* 2025;390:r1893

Find the full version with references at <http://dx.doi.org/10.1136/bmj.r1893>

Zhen-qiang Ma
zma@pa.gov

See bmj.com for author details

Effect of methylcobalamin on capecitabine induced hand-foot syndrome in patients with HER2 negative early breast cancer

Xia Y, Zhu Y, Ling L, et al

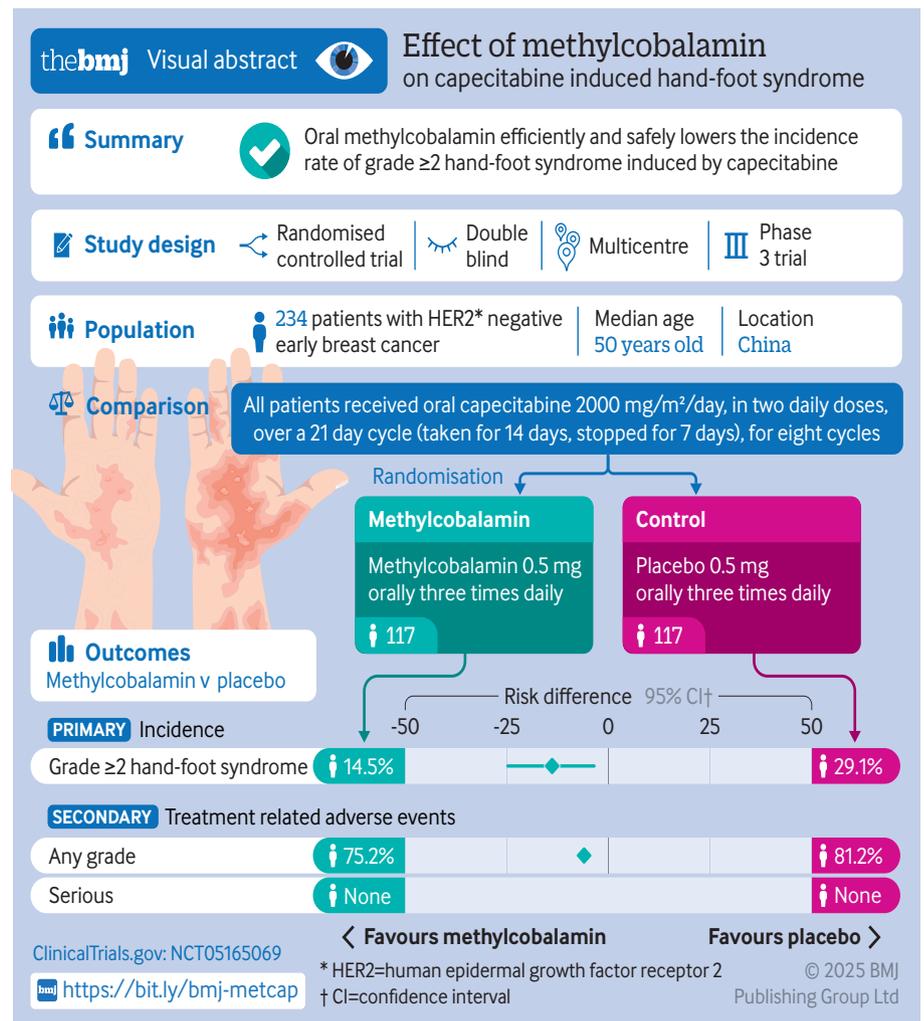
Cite this as: *BMJ* 2025;390:e084290

Find this at doi: 10.1136/bmj-2025-084290

Study question Does methylcobalamin effectively prevent grade 2 or 3 hand-foot syndrome during adjuvant capecitabine treatment?

Methods This trial enrolled 234 Chinese women with human epidermal growth factor receptor 2 (HER2) negative early breast cancer scheduled to receive adjuvant capecitabine treatment (2000 mg/m²/day). Participants were randomly assigned in a 1:1 ratio to receive oral methylcobalamin (0.5 mg three times daily) or placebo for a maximum of 24 weeks. The primary endpoint was the incidence of grade ≥2 hand-foot syndrome occurring for the first time during capecitabine treatment.

Study answer and limitations Oral methylcobalamin significantly lowered the severity of hand-foot syndrome by reducing the incidence of grade ≥2 symptoms compared with placebo (17/117 (14.5%) v 34/117 (29.1%); risk difference -14.5%, 95% confidence interval -24.9% to -4.1%; one sided P=0.003) with a favourable safety profile. The rate of reduction or discontinuation of capecitabine treatment because of hand-foot syndrome was 7.7% (9 of 117) in the methylcobalamin group and 13.7% (16 of 117) in the placebo group (risk difference -6.0%, -13.9% to 1.9%). Because of pharmacokinetic differences in capecitabine metabolism between Asian and non-Asian



populations, generalisability of findings to patients from other geographical regions or different ethnic groups requires caution.

What this study adds This study supports the use of methylcobalamin to prevent capecitabine associated severe hand-foot syndrome in women with HER2 negative early breast cancer receiving adjuvant capecitabine treatment.

Funding, competing interests, and data sharing Supported by grants from the National Science and Technology Major Project, National Natural Science Foundation of China, and Sun Yat-sen University Clinical Research 5010 Program. No competing interests declared. The raw database underlying the study is available at <https://doi.org/10.5061/dryad.gmsbcc31k>

Trial registration ClinicalTrials.gov NCT05165069.

MORE RESEARCH ON BMJ.COM

Gomes C, et al. Risk prediction models for cancer therapy related cardiac dysfunction in patients with cancer and cancer survivors: systematic review and meta-analysis. *BMJ* 2025;390:e084062. doi:10.1136/bmj-2025-084062.

Gomes and colleagues review all prediction models developed or validated for cardiac dysfunction related to cancer therapy and quantitatively analyse their performance.

The *BMJ* is an Open Access journal. We set no word limits on *BMJ* research articles but they are abridged for print.

The full text of each *BMJ* research article is freely available on [bmj.com](https://www.bmj.com).

The online version is published along with signed peer and patient reviews for the paper, and a statement about how the authors will share data from their study. It also includes a description of whether and how patients were included in the design or reporting of the research.

The linked commentaries in this section appear on [bmj.com](https://www.bmj.com) as editorials. Use the citation given at the end of commentaries to cite an article or find it online.