Improving screening uptake for oral, breast and cervical cancers, hypertension, and diabetes in adult patients in urban areas:

Rapid evidence synthesis

This document is a supplement to the policy brief on the issue.

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List of abbreviations

BSE – Breast self-examination
CBE – Clinical breast examination
CCS – Cervical cancer screening
CPHC - Comprehensive primary healthcare
HIC – High income country
HPV – Human papilloma virus
ITS – Interrupted time series
LMIC – Lower-middle income country
NCDs – Noncommunicable diseases
NPCDCS (India) - National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke
PICOS – Population, Intervention, Comparator, Outcome, Study design
PRISMA - Preferred Reporting Items for Systematic Reviews and Meta-analyses
RCT – Randomised controlled trial
UMIC – Upper-middle income country
VIA – Visual acetic acid examination

Contents

1. Introduction 5
2. Methods 6
Protocol development and registration 6
Eligibility Criteria (PICOS) 6
Inclusion criteria 6
Exclusion criteria: 7
Information sources and search 7
Study selection and data collection process 7
Assessment of risk of bias in included studies 7
Data Collection 7
Data Synthesis 8
3. Results 8
Search results and study selection 8
Characteristics of included studies 8
Cervical cancer 9
Breast cancer 20
Oral cancer, diabetes and hypertension 22
4. Gaps in evidence 22
5. Recommendations for future research 22
6. References 22
7. Appendix 24
Appendix 1: Search strategies 24
Appendix 2: Search strategies for primary studies (cervical and breast cancers only) 27
Appendix 3: Search strategies for primary studies (diabetes, hypertension, and oral cancer only) 36
Appendix 4 – PRISMA flow charts 48
Appendix 5: List of excluded systematic reviews with reasons for exclusion 51
Appendix 6: List of excluded primary studies with reasons for exclusion 54
Appendix 7: List of excluded primary studies with reasons for exclusion (diabetes hypertension and oral cancer) 55

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1. Introduction

According to the World Health Organization (WHO), non-communicable diseases (NCDs) are defined as chronic diseases that tend to be of long duration, which are the result of a combination of genetic, physiological, environmental and behavioural factors.(1) Main types of NCDs are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes. The findings of The Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2019 reported that disability caused by NCDs has emerged as the largest contributor to the global disease burden.(2) The burden of NCDs, particularly ischaemic heart disease, stroke, and diabetes has increased considerably over the last few decades as they account for more than one half of global health loss.(2) Breast cancer (8·2%), cancers of lip and oral cavity (7·2%), cervical cancer (5·2%), are reported to be among the top ten cancers responsible for the highest proportion of cancer disability adjusted life years (DALYs) in India in 2016.(3)

It is estimated that 80% of premature NCD deaths occur in lower-middle income countries (LMICs).(1) A pan Indian study explored the urban and rural differences in the self-reported diabetes in India and concluded that prevalence of diabetes is higher in urban and peri urban areas when compared to rural areas.(4) Indian population has an earlier onset of NCDs than compared to other populations.(5, 6)

The Ministry of Health and Family Welfare (MoHFW) under the Ayushman Bharat Comprehensive Primary Healthcare (CPHC) program launched a population-based screening program for all men and women of age group thirty years and above, with a specific focus on hypertension, diabetes, oral, breast and cervical cancers. The National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) operational guideline states that appropriate strategies that combine effective outreach and facility based UPHC services should be developed for NCD screening in urban areas in PHCs and the community health centres (CHCs).(7) The focus of NPCDCS is to enable opportunistic screening for common Non-Communicable Diseases (NCDs) at District Hospital and Community Health Centres level, through the setting up of NCD clinics.

To expand the range of services to be delivered under Comprehensive Primary Health Care (CPHC), Universal Screening for five common NCDs, i.e. hypertension, diabetes, cancers of the oral cavity, cervix and breast was launched in the year 2016, for individuals aged 30 years and above.(8-10) The key components of this programme include population enumeration, assessment of risk factors by Accredited Social Health Activists (ASHAs), health promotion, community mobilisation for screening at sub centres/Primary health centres in rural and urban areas, treatment initiation at a PHC, and follow up at household level to ensure treatment compliance.(8-10)

Implementation of universal screening, prevention and management of common NCDs initiative was reported to be at different stages in different states.(9)

Therefore, this rapid review focussed on screening (both organised and opportunistic) uptake and coverage related to oral, breast and cervical cancers, hypertension, and diabetes, within the LMIC context. This review is complemented by another rapid review that aimed to identify enablers and barriers that impact screening uptake and implementation, specifically from LMICs.

Review question

What are the different strategies used to increase uptake of screening for hypertension, diabetes, oral, breast and cervical cancers in in adult patients over 30 years in urban areas?

2. Methods

Protocol development and registration

We developed a protocol for the study a priori. However, the protocol was not registered owing to the rapid nature of the evidence synthesis .

Eligibility Criteria (PICOS)

Inclusion criteria

We included studies, which met the following criteria:

Population

Adults aged 30 years or older living in urban areas, screened for the following NCDs: breast cancer, cervical cancer, oral cancer, diabetes, and hypertension. Additionally, healthcare providers who are involved in the provision and delivery of screening were included.

Intervention

Interventions that seek to increase screening uptake but not limited to educational interventions or counselling (one-on-one or group), reminders, invitation letters, telephone calls, media and awareness campaigns, incentivisation schemes/programmes, patient navigation, home visits, provider assessment and feedback, provision of access to services, communication, transportation provision, social support, and text messaging interventions. The above interventions were identified during the initial scoping of the literature.

Comparator

No intervention or standard/routine care.

Outcome

Increase in screening uptake/screening rates in urban areas, measured as self-reported or medically verified record of any type of screening service.

Context

Facility-based screening services, mobile screening services, community-based and mixed services in LMICs.

Study designs

Systematic reviews (SRs) of randomised controlled trials (RCTs), non-randomised studies such as controlled before and after studies (CBAs), interrupted time series (ITS) studies and cohort studies were considered, as they demonstrate a change in screening uptake over time or between two groups. In the absence of systematic reviews on any of the NCDs or interventions of interest, primary studies (aforementioned study designs) were considered for inclusion.

Exclusion criteria: Cancers other than breast, cervical and oral. Editorials, newspapers, and popular media. Grey literature.

Information sources and search

Comprehensive search strategies (Appendices 1, 2 and 3) for identifying systematic reviews and/or primary studies were developed, and searches were carried out in databases such as Medline (PubMed), Embase and Health Systems Evidence. The search was restricted to English language and articles published within last 10 years for recency and relevancy, within a LMIC context. Additional searches were conducted for relevant primary studies (aforementioned) in the last 10 years, where systematic reviews were not available for NCDs of interest.

Study selection and data collection process

Studies were screened for potential inclusion by two independent reviewers (title and abstract screening together, followed by full text screening). The 2020-2021 World Bank country income classification was used to identify and include relevant studies from LMICs.(11)

Assessment of risk of bias in included studies

Risk of bias was not deemed necessary for the eligible systematic reviews and/or primary studies due to the limited evidence available.

Data Collection

Data was extracted by an independent reviewer using a predesigned data extraction form and the second reviewer assessed the correctness of the data by selecting 25% of the studies randomly. Relevant data on country/region, sample characteristics,

study designs, screening method/type, interventions, and screening rates were extracted.

Data Synthesis

A narrative approach was used to summarise the findings aided by tables where appropriate. In terms of reporting quantitative data, the number of studies that inform the outcome, the number of participants from included studies and the heterogeneity of the results of included reviews were reported. Depending on the results, the studies were grouped by type of NCD, and study designs.

3. Results

Search results and study selection

The database searches for systematic reviews (SRs) for all the NCDs of interest identified 2816 records. After removal of 583 duplicates, we screened 2233 records based on titles and/or abstracts. We retrieved full texts of 62 SRs which were deemed to be potentially eligible for further examination. On full text screening, five SRs were included in this report. Figure 1 (Appendix 4) shows the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow chart for SRs. The list of excluded SRs (n=57/62) with reasons for exclusion at the full text level is presented in Appendix 5.

The database searches for primary studies of interest for cervical and breast cancers, and diabetes, hypertension and oral cancer were performed separately. The searches identified 368 and 239 studies respectively (Figures 2 and 3). Figure 2 (Appendix 4) shows the PRISMA flow chart with the study selection process for primary studies related to cervical and breast cancers. On full text screening, five studies were included. The list of excluded studies (n=6/11) with reasons for exclusion at the full text level is presented in Appendix 6. Figure 3 (Appendix 4) shows the PRISMA flow chart for primary studies relevant to diabetes, hypertension and oral cancer. Only one study was deemed potentially eligible for full text examination; however, the outcome was not relevant to the review (Appendix 7).

Characteristics of included studies

Overall, seven SRs(12-16) and five primary studies(17-21) related to cervical and breast cancer screening uptake were included in the report. The majority of the SRs included only one or two studies from LMICs. Only one SR specifically examined evidence from sub-Saharan Africa region.(13) Majority of the evidence related to uptake of cervical cancer screening, with four systematic reviews(13-16) and four primary studies(17, 19-21) evaluating various interventions. Only two records were identified that examined effectiveness of interventions related to breast cancer screening uptake. One was a SR(12) and one was conference abstract(18).

Cervical cancer

Health education

Community outreach, individual patient teaching and counselling, provider training, mass media campaigns

A systematic review by Johnson et al included studies conducted in all regions of sub-Saharan Africa.(13) However, only six trials evaluated strategies to increase cervical cancer screening (CCS) uptake through educational interventions. The strategies included community outreach, individual patient teaching and counselling, provider training, mass media campaigns, and development of educational materials. While these strategies were found to be the most popular method to improve implementation, the review authors suggested that the dissemination of information was not the most effective method for creating sustainable change. The included studies in the review showed improvements in awareness; however, these strategies on their own did not catalyse into increased uptake.(13)

Training of health providers (Anganwadi workers)

Only one study from a LMIC (India) was included in the review by Lu et al.(14) This study evaluated the use of anganwadi workers in a cancer screening program who were trained and used to organise cancer screening camps. Simple charts in local language with pictures containing details of risk factors and early symptoms, explaining Pap smear were given to the workers. Attendance to the camps improved from 24 women to 82 women during the study period, with 87.8% women ready to undergo Pap smear compared to only 33.3% women prior to the intervention. Community outreach with the help of an anganwadi worker was found to be a simple, cost effective strategy for cancer screening among Indian women.(14) Currently, under the Universal Screening of Common NCDs in India, training for Visual Acetic Acid (VIA) screening is being conducted for Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs), for five and three days, respectively.(22)

Nurse-led health education

Two studies evaluated the effects of a nurse-led educational intervention on cervical cancer screening uptake, one in Ethiopia(17) and one in Nigeria(20), respectively. Trained staff nurses (working in immunisation, family planning, and children clinics) provided one-to-one health education (5-10 minutes) to all eligible mothers in antenatal clinics within the health centres, and in addition, brochures and flex charts containing information (written in simple language) were given too. Results from the Ethiopian study showed that women from intervention group had higher odds (Odds ratio (OR) = 2.43 (95% Confidence Interval (CI) 1.58– 2.90) of getting screened than women from the control group.(17) The Nigerian study reported that the uptake was 6 (1.4%) for intervention group and 9 (2.1%) for control group at baseline.(20) Uptake of CCS increased slightly from 1.4% at baseline to 3.6% in the IG and 2.1 to 2.3% in the

CG, post intervention. Overall, CCS uptake was low among the women but improved slightly, post-intervention in the IG.(20) Overall, it was found that one-to-one health talk and issuing brochures as a reminder for women significantly increased cervical cancer screening uptake.(17, 20)

Culturally tailored community-based intervention

A study by Nkwonta et al (2020) evaluated the impact of two community-based educational interventions on Nigerian adults' intention to take or encourage cervical screenings.(21) Participants were allocated to either the Presentation Group, who attended a face-to-face oral presentation, or the Pamphlet Group, who received a printed educational pamphlet. These educational materials were then tailored to ensure that they were culturally and environmentally relevant for the target population. At baseline, less than 12% had ever received or had a family member who had received cervical screening. A significant increase (>70%) in the intention to take cervical screening was reported post-intervention. Both community-based educational methods significantly increased participants' cervical cancer screening, post intervention.(21)

Table 1 Characteristics of included systematic reviews on health education interventions for increasing cervical cancer screening uptake

Review citation	Review characteristics (no. of studies, study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Interventions (duration, frequency, intensity) & comparator	Results
Johnson et al 2018(13)	Number of studies- 53 Sub Saharan Region countries - South Africa, Nigeria, Cameroon, Kenya, Uganda, Ghana, Botswana, Tanzania, Cote d'Ivoire, Zambia, Gambia , Mozambique, Malawi, Madagascar, Mali Study Designs - Pre-post-test, RCT, non-RCT Settings: both urban and rural Study Designs - RCTs, Quasi-experimental studies - before and after designs	Sample size- not mentioned for individual studies Gender- HIV Infected women, young women Type of NCD: Cervical Cancer	VIA; HPV DNA or RNA test; Pap smear; Digital imaging; Unspecified screening	Individual Based interventions: through counselling using pamphlets, counselling on the complications, cost and treatment options Group based interventions: Interventions using video, visuals and pamphlets, group lectures in the community. Description of comparators or controls has not been mentioned in the Systematic Review.	Outcome measures: Uptake Implementation Strategy 1.Educate; 2.Restructure; 3.Quality; 4.Finance; 5.Plan Education strategies were used most often but have shown limited effectiveness.

Review citation	Review characteristics (no. of studies, study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Interventions (duration, frequency, intensity) & comparator	Results
Lu et al 2012(14)	Number of studies – Only one study relevant to LMIC Countries - India Study Designs - QES Follow up: NR	Sample size - 152 Gender - women attending screening camp Type of NCD: Cervical Cancer	Pap smear	Health education through anganwadi workers and use of simple charts in local language with pictures containing details of risk factors and early symptoms, Pap smear	Attendance to the camps improved from 24 women to 82 women. 87.8% women were ready to undergo Pap smear compared to only 33.3% women prior to the intervention.

Table 2 Characteristics of included primary studies on health education interventions for increasing cervical cancer screening uptake

Review citation	Study characteristics (study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Intervention/s (duration, frequency, intensity) & comparator	Outcomes/findings
Abu et al 2020(17)	Design: clustered RCT Country: Ethiopia Setting: Urban areas	Sample Size:2140 Age of Participants: 30-49 years	VIA	Intervention: The trained nurses provided one-to-one health education to all eligible mothers	Women from intervention health centres had higher odds adjusted odds ratio (AOR) = 2.43 (95%CI;1.58–

Review citation	Study characteristics (study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Intervention/s (duration, frequency, intensity) & comparator	Outcomes/findings
		Gender: women Type of NCD: Cervical Cancer		who come seeking care from the clinics within the health centres. Intensity of the intervention: Health education on cervical cancer was supposed to be given twice a week. Duration of the intervention: A one-to-one brief health talk lasting 5–10 minutes was provided by health care providers. Follow up: Two months from the time of intervention. Comparator: Women in the control group were interviewed using the same standard questionnaire. In addition, only received standard care (did not receive either the one-to-one brief health talk or the educational brochure).	2.90) of getting screened than women from the control health centres. The odds of women with first degree and above to test for cervical cancer is higher AOR = 2.03,95%CI;(1.15–2.58) than the illiterates. Likewise, women who had a history of STI had higher odds to get tested AOR = 1.55,95%CI;(1.01–2.40)

Review citation	Study characteristics (study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Intervention/s (duration, frequency, intensity) & comparator	Outcomes/findings
Ndikom et al 2017(20)	Quasi-experimental with pre-test/post-test experimental and control groups. Country: Nigeria	Sample Size:904 Age of Participants: mean age were 27.9 ± 5.8 years Gender: women Type of NCD: Cervical Cancer	Not reported	Intervention: The educational intervention was in the form of focused health information on cervical cancer and screening given to women attending antenatal clinics by the nurses in the clinic. IG: Flex charts with comprehensive information on cervical cancer were used by the nurses in providing the information on cervical cancer in the clinics CG: No intervention Duration: 4 weeks	There was only a very slight increase in uptake of CCS from 1.4% at baseline to 3.6% in the IG and 2.1 to 2.3% in the CG. Over, 53.5% said unavailability of services was a major hindrance to their screening uptake. The study improved willingness to uptake cervical cancer screening services, but actual uptake remained poor.
Nkwonta et al 2020(21)	Design: RCT (double blind) Country: Nigeria	Sample Size: Age of Participants: 18-65 years Gender: men and women Type of NCD: Cervical Cancer	Not reported	Intervention: Health Education Intervention (a) pictorial and introductory information on the HPV, cervix and cervical cancer, including statistical facts of HPV and cervical cancer incidence in Nigeria, (b) pictorial	Postintervention, there was significant increase (>70%) in the participants knowledge and intention to take or encourage cervical screening. In addition, more than half were willing to pay for HPV

Review citation	Study characteristics (study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Intervention/s (duration, frequency, intensity) & comparator	Outcomes/findings
				and introductory information on the HPV vaccine and cervical screenings as a protective, preventive and early detection method for HPV, and cervical cancer, information on common misconceptions, and (d) availability of HPV vaccine and screenings in local pharmacies and hospital. Participants recruited in large groups (e.g., churches, organisations) received face-to-face group-based education, whilst participants recruited in single groups (e.g., large extended families) or alone received printed pamphlet-based education. The content for health education was developed from Centers for Disease Control and Prevention educational resources. These educational materials were then tailored to ensure that they were	vaccine and screening even when expensive.

Review citation	Study characteristics (study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Intervention/s (duration, frequency, intensity) & comparator	Outcomes/findings
				culturally and environmentally relevant for the target population. Comparator: Health Education provided using presentation and pamphlets	

mHealth

Text messaging and reminders

Zhang et al (2020) in their SR reported that the utilisation of a telephone reminder or a mobile text message when compared with traditional communication methods (e.g., postal mail) was found to increase uptake of CCS. SMS messages with eVoucher (v single SMS) significantly increased screening attendance (OR, 4.7; 95% CI, 2.9 to 7.4).(16) mHealth intervention consisted of an invitation letter with telephone reminders; and unique short message services (SMS) messages focusing on importance of screening; and eVoucher (for transportation costs, delivered via SMS, covered return transportation, minibus or motorcycle taxi, to the nearest screening clinic) valid for 2 months.(16)

Self-sampling

Yeh et al 2019 in their SR examined evidence on the effectiveness of human papillomavirus (HPV) self-sampling on CCS uptake among women aged between 30 to 60 years.(15) Only two RCTs from LMICs, one from Nigeria and one from Uganda were included in the review. The studies included an intervention group where women used HPV self-sampling kit directly mailed to home address with prepaid return envelope (or could drop off completed kit at designated collection points in community or at the hospital). Women in the control group were either HPV tested at hospital clinic in the study conducted in Nigeria or screened by a healthcare provider (using VIA) in the study conducted in Uganda. The results showed that women were twice as likely to use CCS services through self-sampling compared with standard-of-care screening practices. Further analysis showed that HPV self-sampling was associated with an increased uptake, with a greater impact in high-income countries (Relative Risk (RR): 2.24, 95% CI 1.86 to 2.71) compared to LMICs (RR: 1.54, 95% CI 1.01 to 2.34).(15)

National cervical cancer screening programme

The benefits of CCS programme using visual inspection with acetic acid (VIA) was analysed in a cohort study. In response to a high burden of cervical cancer, the Malawi Ministry of Health implemented screen-and-treat programme using VIA.(19) It was reported that over a period of five years, the number of cervical cancer screening sites, and number of women screened increased from 75 to 130 and 15,331 to 49,301 respectively. The integration of the programme with family planning services that targeted women aged 30–45 years was contributing factor to increase in CCS uptake.(19)

Table 3 Characteristics of included systematic reviews on mHealth and self-sampling interventions for increasing cervical cancer screening uptake

Review citation	Review characteristics (no. of studies, study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Interventions (duration, frequency, intensity) & comparator	Results
Zhang et al 2020(16)	Number of studies – 8, with only two studies relevant to LMICs Countries - Tanzania, South Africa Study Designs - One QES and one RCT	Adults with cervical cancer. Sample size 1,557 participants. Average age ranged from 21 to 65 years	Papanicolaou (Pap) test	Utilisation of telephone or message reminder as the intervention. Screening uptake reported in only one study from LMIC. Intervention 1: 15 unique SMS messages aiming to change screening behaviors Intervention; 2: 15 unique SMS messages and eVoucher valid for 2 months; Control: 1 SMS message showing the location and hours of the closest screening clinic	In a 60-day RCT, it was found that sending multiple short message service (SMS) messages with eVoucher (v single SMS) significantly increased screening attendance (OR, 4.7; 95% CI, 2.9 to 7.4); the results also showed that participants receiving 15 SMS messages were more likely to attend screening (OR, 3.0; 95% CI, 1.5 to 6.2). Another study found that telephone call reminders, as compared with letters, increased the utilization of Pap tests among women who had a history of Pap test in the past year (OR, 2.38; 95% CI, 1.56 to 3.63).

Review citation	Review characteristics (no. of studies, study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Interventions (duration, frequency, intensity) & comparator	Results
Yeh et al 2019(15)	Number of studies- 33 Countries- Only two studies from LMICs - Nigeria and Uganda. Study Designs - RCTs	Sample size - 400 and 500 respectively Gender - women aged between 30 to 65 years. Type of NCD: Cervical cancer	HPV testing	Type of intervention: HPV self-sampling kit directly mailed to home address with prepaid return envelope (or could drop off completed kit at designated collection points in community or at the hospital). HPV self-sampling kit and education offered door-to-door by outreach worker. Duration of these interventions: one month Comparators: HPV testing appointment at hospital clinic or Screened by healthcare provider (VIA)	Outcome measures: Uptake of HPV testing services. Results: women were twice as likely to use cervical cancer screening services through self-sampling compared with standard-of-care screening practices.

Breast cancer

Health education by trained health workers

Only one study from LMICs was included in a SR by Agide et al (2018), which was conducted in India.(12) The study examined the efficacy of a community-based health education intervention provided by trained health workers to increase the uptake of breast cancer screening. The results showed that breast self-examination (BSE) significantly increased from 0 to 93%, post-intervention. The findings showed that health promotion intervention through health education improved breast cancer screening uptake.(12)

Trained laywomen

A study in Malawi assessed clinical breast examination (CBE) delivered by trained laywomen along with other health services.(18) Four laywomen were trained to deliver breast cancer educational sessions and conduct CBE in women aged ≥30years. The health providers delivered 175 educational talks to 4,295 people across five clinics. Results showed that women who attended the education sessions were more likely to accept CBE than women who did not (83%vs 77%,p=0.012). Uptake of CBE screening was reported to be high, with 1,000 (82%) agreeing to CBE, post educational sessions.(18)

Table 4 Characteristics of included systematic review on mHealth intervention for increasing breast cancer screening uptake

Review citation	Review characteristics (no. of studies, study design/s, country/ies, settings, follow up)	Participants' characteristics (sample size, gender, age, type of NCD/s)	NCD screening method	Interventions (duration, frequency, intensity) & comparator	Results
Agide et al 2018(12)	Number of studies-22, but only one study from LMIC Countries - India Study designs - pre-post design	Sample size-1000 women. Mean age 29.61 and most of the participants aged between group of 20-40 years. Type of NCD: Breast Cancer	Breast self-examination (BSE)	Health education intervention form of Information, Education and Communication (IEC) activity; distribution of pamphlets; a short lecture in the local language along with demonstration; and a short educational film	Outcome measures: Increase in the BSE rates An overall increase in the awareness of 43% and 53% of BSE practice was observed in the study group post intervention. Even though a 43% increase in the awareness was observed in intervention group, 55 respondents (9.3% of those who acquired knowledge post intervention) had not started practicing BSE.

Oral cancer, diabetes and hypertension

There was a lack of evidence on strategies to increase screening uptake for oral cancer, diabetes and hypertension. No SRs or primary studies of relevance were identified.

4. Gaps in evidence

- The burden of NCDs, particularly cervical and breast cancers is higher in LMICs; however, the evidence suggests that the corresponding screening rates are lower compared with developed countries suggesting that an effective and convenient intervention approach is needed in these areas to promote cervical cancer screening.
- There is a significant gap in evidence on interventions designed to improve screening uptake for oral cancer, diabetes, and hypertension.

5. Recommendations for future research

The limited evidence from LMICs, particularly from South Asia showed that further research including high quality studies, particularly quasi-experimental studies is needed to bridge the knowledge gaps. While RCTs are the gold standard in effectiveness research, they may not be feasible to conduct due to the use of multi-level and multi-strategy interventions, particularly when it comes to implementation.

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7. Appendix

Appendix 1: Search strategies

PubMed

No	Search Strategy	Hits
1	(diabetes mellitus[MeSH] OR diabet*[tiab] OR “T2DM”[tiab])	707,871
2	(Hypertension[MeSH] OR hypertension[tiab] OR “elevated blood pressure”[tiab])	480,011
3	(mouth neoplasm[tiab] OR mouth neoplasms[MeSH] OR “oral neoplasm” [tiab] OR “oral neoplasms”[tiab] OR “oral cancer”[tiab] OR “oral cancers”[tiab] OR “cancer of mouth”[tiab] OR “mouth cancer”[tiab])	73,819
4	(“uterine cervical cancer”[tiab] OR uterine cervical neoplasm[MeSH] OR cervical intraepithelial neoplasia[MeSH] OR “cervical intraepithelial neoplasia”[tiab] OR “uterine cervix cancer”[tiab] OR "cervical neoplasm"[tiab] OR "cervical neoplasms"[tiab] OR “cervical cancer”[tiab] OR “cervix cancer”[tiab] OR “cervix neoplasms”[tiab] OR "uterine cervical neoplasm"[tiab] OR "uterine cervical neoplasms"[tiab] OR "cancer of the uterine cervix"[tiab] OR “cancer of the cervix"[tiab] OR "cervical cancers"[tiab] OR "cervix cancers"[tiab] OR "cervical dysplasia"[tiab] OR "cervix dysplasia"[tiab])	95,074
5	(“breast cancer*”[tiab] OR breast neoplasms[MeSH] OR “breast neoplasm*”[tiab] OR “breast carcinoma”[tiab] OR “breast tumor*”[tiab] OR “cancer of breast” [tiab] OR “human mammary carcinoma”[tiab] OR “malignant tumor of breast”[tiab] OR “mammary cancer”[tiab])	387,101
6	1 OR 2 OR 3 OR 4 OR 5	1,636,573
7	(mass screening[MeSH] OR screening[tiab] OR “early detection of disease”[tiab] OR “urinary glucose”[tiab] OR “urine glucose”[tiab] OR “venous fasting plasma glucose”[tiab] OR “fasting capillary blood glucose”[tiab] OR “glycated haemoglobin”[tiab] OR “glycated hemoglobin”[tiab] OR early detection of cancer[MeSH] OR "cancer early detection"[tiab] OR "early diagnosis of cancer"[tiab] OR “visual oral examination”[tiab] OR “clinical oral examination”[tiab] OR “visual acetic acid”[tiab]	1,669,856

	OR VIA[tiab] OR "pap smear"[tiab] OR "pap test"[tiab] OR "Papanicolaou test"[tiab] OR "vaginal smear"[tiab] OR "cervical smear*"[tiab] OR mammogram*[tiab] OR mammography[tiab] OR "self-breast examination"[tiab] OR "clinical breast examination"[tiab])	
8	"systematic review*"[tiab] OR meta-analysis as topic[MeSH] OR "meta-analy*"[tiab] OR "metaanaly*"[tiab] OR systematic reviews as topic[MeSH] OR "overview of systematic review*"[tiab] OR overview*[tiab] OR "umbrella review*"[tiab]	464,674
9	uptake[tiab] OR utilization[tiab] OR utilisation[tiab] OR participat*[tiab] OR "screening rate*"[tiab] OR increase*[tiab] OR improv*[tiab]	7,499,721
10	6 AND 7 AND 8 AND 9 Filters: 10 years; English	2,108

Embase

No	Search Strategy	Hits
1	(("diabetes mellitus"/de) OR (diabet* OR "T2DM"):ti OR (diabet* OR "T2DM"):ab)	1,188,172
2	(("elevated blood pressure"/de) OR (hypertension OR "elevated blood pressure"):ti OR (hypertension OR "elevated blood pressure"):ab)	606,385
3	(("mouth cancer"/de) OR ("mouth neoplasm*" OR "oral neoplasm*" OR "oral cancer*" OR "cancer of mouth" OR "mouth cancer*"):ti OR ("mouth neoplasm*" OR "oral neoplasm*" OR "oral cancer*" OR "cancer of mouth" OR "mouth cancer*"):ab)	25,517
4	(("uterine cervix cancer"/de) OR ("uterine cervical cancer" OR "uterine cervix cancer" OR "cancer of the uterine cervix" OR "cervical intraepithelial neoplasia" OR "cervical neoplasm*" OR "cervical cancer*" OR "cervix cancer*" OR "cervix neoplasm*" OR "uterine cervical neoplasm*" OR "cancer of the cervix" OR "cervical dysplasia" OR "cervix dysplasia"):ti OR ("uterine cervical cancer" OR "uterine cervix cancer" OR "cancer of the uterine cervix" OR "cervical intraepithelial neoplasia" OR "cervical neoplasm*" OR "cervical cancer*" OR "cervix cancer*" OR "cervix neoplasm*" OR "uterine cervical neoplasm*" OR "cancer of the cervix" OR "cervical dysplasia" OR "cervix dysplasia"):ab)	100,375
5	(("breast tumor"/de) OR ("breast cancer*" OR "breast neoplasm*" OR "breast carcinoma*" OR "breast tumor*" OR "breast tumour*" OR "cancer of breast" OR "human mammary carcinoma" OR "malignant tumor of breast" OR "mammary cancer*"):ti OR ("breast cancer*" OR "breast neoplasm*" OR "breast carcinoma*" OR "breast tumor*" OR "breast tumour*" OR "cancer of breast" OR "human mammary carcinoma" OR "malignant tumor of breast" OR "mammary cancer*"):ab)	484,022
6	1 OR 2 OR 3 OR 4 OR 5	2,229,863
7	(("mass screening"/de OR Papanicolaou test/de OR mammography/de) OR (screening OR "early detection of disease" OR	954,848

	“anonymous testing” OR questionnaires OR “urinary glucose” OR “urine glucose” OR “venous fasting plasma glucose” OR “fasting capillary blood glucose” OR “glycated haemoglobin” OR “glycated hemoglobin” OR “early detection of disease” OR “early detection of cancer” OR "early diagnosis of cancer" “visual oral examination” OR “clinical oral examination” OR “pap smear” OR “pap test” OR “Papanicolaou test” OR “vaginal smear” OR “cervical smear” OR “visual ascetic acid” OR mammogram* OR mammography OR “self-breast examination” OR “clinical breast examination”):ti OR (screening OR screenings OR “early detection of disease” OR “anonymous testing” OR questionnaires OR “urinary glucose” OR “urine glucose” OR “venous fasting plasma glucose” OR “fasting capillary blood glucose” OR “glycated haemoglobin” OR “glycated hemoglobin” OR “early detection of disease” OR “early detection of cancer” OR "early diagnosis of cancer" OR “visual oral examination” OR “clinical oral examination” OR “pap smear” OR “pap test” OR “Papanicolaou test” OR “vaginal smear” OR “cervical smear” OR “visual ascetic acid” OR mammogram* OR mammography OR “self-breast examination” OR “clinical breast examination”):ab)	
8	((systematic review/de) OR (“systematic review*” OR “meta-analy*” OR “metaanaly*” OR “overview of systematic review*” OR overview* OR “umbrella review*”):ti OR (“systematic review*” OR “meta-analy*” OR “metaanaly*” OR “overview of systematic review*” OR overview* OR “umbrella review*”):ab)	631,006
9	((uptake OR utilization OR utilisation OR participat* OR “screening rate*” OR increase OR improve):ti OR (uptake OR utilization OR utilisation OR participat* OR “screening rate*” OR increase OR improve):ab)	4,976,345
10	6 AND 7 AND 8 AND 9 AND [english]/lim AND [humans]/lim AND [embase]/lim AND [2010-2020]/py	1,178

Health Systems Evidence

No	Search Strategy	Hits
1	(diabetes OR hypertension OR oral cancer OR cervical cancer OR breast cancer) AND (mass screening OR screening) AND (uptake OR increase OR improve OR participation) Filters: Document type (overviews of systematic reviews, systematic reviews of effects, systematic reviews addressing other questions); Date range (10 years)	235

Appendix 2: Search strategies for primary studies (cervical and breast cancers only)

PubMed

No	Search Strategy	Hits
1	(“uterine cervical cancer”[tiab] OR uterine cervical neoplasm[MeSH] OR cervical intraepithelial neoplasia[MeSH] OR “cervical intraepithelial neoplasia”[tiab] OR “uterine cervix cancer”[tiab] OR "cervical neoplasm"[tiab] OR "cervical neoplasms"[tiab] OR “cervical cancer”[tiab] OR “cervix cancer”[tiab] OR “cervix neoplasms”[tiab] OR "uterine cervical neoplasm"[tiab] OR "uterine cervical neoplasms"[tiab] OR "cancer of the uterine cervix"[tiab] OR “cancer of the cervix"[tiab] OR "cervical cancers"[tiab] OR "cervix cancers"[tiab] OR "cervical dysplasia"[tiab] OR "cervix dysplasia"[tiab])	95,316
2	(“breast cancer*”[tiab] OR breast neoplasms[MeSH] OR “breast neoplasm*”[tiab] OR “breast carcinoma”[tiab] OR “breast tumor*”[tiab] OR “cancer of breast” [tiab] OR “human mammary carcinoma”[tiab] OR “malignant tumor of breast”[tiab] OR “mammary cancer”[tiab])	388,407
3	1 OR 2	477,700
4	(mass screening[MeSH] OR screening[tiab] OR “early detection of disease”[tiab] OR early detection of cancer[MeSH] OR "cancer early detection"[tiab] OR "early diagnosis of cancer"[tiab] OR “visual oral examination”[tiab] OR “clinical oral examination”[tiab])	600,225
5	“randomized controlled trial*”[tiab] OR “randomized controlled trials as topic”[MeSH] OR “clinical trial*”[tiab] OR “randomised controlled stud*”[tiab] OR “randomized controlled stud*”[tiab] OR “randomised controlled trial*”[tiab] OR “non-randomized controlled trials as topic”[MeSH] OR “quasi-experimental stud*”[tiab] OR “pretest-posttest”[tiab] OR “non-randomized trial”[tiab] OR “non-randomised trial”[tiab] OR “nonrandomized trial”[tiab] OR “nonrandomised trial”[tiab] OR “controlled before-after studies”[tiab] OR “interrupted time series studies”[tiab] OR “non-randomized”[tw] OR “non-randomised”[tw] OR nonrandomized[tw] OR nonrandomised[tw] OR “cohort stud*”[tw] OR “observational stud*”[tw]	1,190, 663
6	afghanistan[MeSH] OR albania[MeSH] OR algeria[MeSH] OR american samoa[MeSH] OR angola[MeSH] OR antigua and barbuda[MeSH] OR argentina[MeSH] OR armenia[MeSH] OR aruba[MeSH] OR azerbaijan[MeSH] OR bahrain[MeSH] OR bangladesh[MeSH] OR barbados[MeSH] OR republic of belarus[MeSH] OR belize[MeSH] OR benin[MeSH] OR bhutan[MeSH] OR bolivia[MeSH] OR bosnia and herzegovina[MeSH] OR botswana[MeSH] OR brazil[MeSH] OR	1,365,933

	bulgaria[MeSH] OR burkina faso[MeSH] OR burundi[MeSH] OR cabo verde[MeSH] OR cambodia[MeSH] OR cameroon[MeSH] OR central african republic[MeSH] OR chad[MeSH] OR chile[MeSH] OR china[MeSH] OR colombia[MeSH] OR comoros[MeSH] OR democratic republic of the congo[MeSH] OR congo[MeSH] OR costa rica[MeSH] OR cote d'ivoire[MeSH] OR croatia[MeSH] OR cuba[MeSH] OR cyprus[MeSH] OR czech republic[MeSH] OR djibouti[MeSH] OR dominica[MeSH] OR dominican republic[MeSH] OR ecuador[MeSH] OR egypt[MeSH] OR el salvador[MeSH] OR equatorial guinea[MeSH] OR eritrea[MeSH] OR estonia[MeSH] OR swaziland[MeSH] OR ethiopia[MeSH] OR fiji[MeSH] OR gabon[MeSH] OR gambia[MeSH] OR georgia (republic)[MeSH] OR ghana[MeSH] OR gibraltar[MeSH] OR greece[MeSH] OR grenada[MeSH] OR guam[MeSH] OR guatemala[MeSH] OR guinea[MeSH] OR guinea bissau[MeSH] OR guyana[MeSH] OR haiti[MeSH] OR honduras[MeSH] OR hungary[MeSH] OR india[MeSH] OR indonesia[MeSH] OR iran[MeSH] OR iraq[MeSH] OR jamaica[MeSH] OR jordan[MeSH] OR kazakhstan[MeSH] OR kenya[MeSH] OR democratic people's republic of korea[MeSH] OR republic of korea[MeSH] OR kosovo[MeSH] OR kyrgyzstan[MeSH] OR laos[MeSH] OR latvia[MeSH] OR lebanon[MeSH] OR lesotho[MeSH] OR liberia[MeSH] OR libya[MeSH] OR lithuania[MeSH] OR macau[MeSH] OR republic of north macedonia[MeSH] OR madagascar[MeSH] OR malawi[MeSH] OR malaysia[MeSH] OR indian ocean islands[MeSH] OR mali[MeSH] OR malta[MeSH] OR micronesia[MeSH] OR palau[MeSH] OR mauritania[MeSH] OR mauritius[MeSH] OR mexico[MeSH] OR moldova[MeSH] OR mongolia[MeSH] OR montenegro[MeSH] OR morocco[MeSH] OR mozambique[MeSH] OR myanmar[MeSH] OR namibia[MeSH] OR nepal[MeSH] OR netherlands antilles[MeSH] OR nicaragua[MeSH] OR niger[MeSH] OR nigeria[MeSH] OR oman[MeSH] OR pakistan[MeSH] OR panama[MeSH] OR papua new guinea[MeSH] OR paraguay[MeSH] OR peru[MeSH] OR philippines[MeSH] OR poland[MeSH] OR portugal[MeSH] OR puerto rico[MeSH] OR romania[MeSH] OR russia[MeSH] OR rwanda[MeSH] OR samoa[MeSH] OR sao tome and principe[MeSH] OR saudi arabia[MeSH] OR senegal[MeSH] OR serbia[MeSH] OR seychelles[MeSH] OR sierra leone[MeSH] OR slovakia[MeSH] OR slovenia[MeSH] OR melanesia[MeSH] OR somalia[MeSH] OR south africa[MeSH] OR south sudan[MeSH] OR sri lanka[MeSH] OR saint kitts and nevis[MeSH] OR saint lucia[MeSH] OR saint vincent and the grenadines[MeSH] OR sudan[MeSH] OR suriname[MeSH] OR syria[MeSH] OR tajikistan[MeSH] OR tanzania[MeSH] OR thailand[MeSH] OR timor leste[MeSH] OR togo[MeSH] OR tonga[MeSH] OR trinidad	

	and tobago[MeSH] OR tunisia[MeSH] OR turkey[MeSH] OR turkmenistan[MeSH] OR uganda[MeSH] OR ukraine[MeSH] OR uruguay[MeSH] OR uzbekistan[MeSH] OR vanuatu[MeSH] OR venezuela[MeSH] OR vietnam[MeSH] OR middle east[MeSH] OR yemen[MeSH] OR yugoslavia[MeSH] OR zambia[MeSH] OR zimbabwe[MeSH] OR africa south of the sahara[MeSH] OR africa, central[MeSH] OR africa, northern[MeSH] OR africa, southern[MeSH] OR africa, eastern[MeSH] OR africa, western[MeSH] OR west indies[MeSH] OR indian ocean islands[MeSH] OR caribbean region[MeSH] OR central america[MeSH] OR latin america[MeSH] OR south america[MeSH] OR asia, central[MeSH] OR asia, northern[MeSH] OR asia, southeastern[MeSH] OR asia, western[MeSH] OR europe, eastern[MeSH] OR developing countries[MeSH]	
7	afghanistan[tw] OR albania[tw] OR algeria[tw] OR american samoa[tw] OR angola[tw] OR antigua[tw] OR barbuda[tw] OR argentina[tw] OR armenia[tw] OR armenian[tw] OR aruba[tw] OR azerbaijan[tw] OR bahrain[tw] OR bangladesh[tw] OR barbados[tw] OR belarus[tw] OR byelarus[tw] OR belorussia[tw] OR byelorussian[tw] OR belize[tw] OR british honduras[tw] OR benin[tw] OR dahomey[tw] OR bhutan[tw] OR bolivia[tw] OR bosnia[tw] OR herzegovina[tw] OR botswana[tw] OR bechuanaland[tw] OR brazil[tw] OR brasil[tw] OR bulgaria[tw] OR burkina faso[tw] OR burkina fasso[tw] OR upper volta[tw] OR burundi[tw] OR urundi[tw] OR cabo verde[tw] OR cape verde[tw] OR cambodia[tw] OR kampuchea[tw] OR khmer republic[tw] OR cameroon[tw] OR cameron[tw] OR cameroun[tw] OR central african republic[tw] OR ubangi shari[tw] OR chad[tw] OR chile[tw] OR china[tw] OR colombia[tw] OR comoros[tw] OR comoro islands[tw] OR mayotte[tw] OR congo[tw] OR zaire[tw] OR costa rica[tw] OR cote d'ivoire[tw] OR cote d' ivoire[tw] OR cote divoire[tw] OR cote d ivoire[tw] OR ivory coast[tw] OR croatia[tw] OR cuba[tw] OR cyprus[tw] OR czech republic[tw] OR czechoslovakia[tw] OR djibouti[tw] OR french somaliland[tw] OR dominica[tw] OR dominican republic[tw] OR ecuador[tw] OR egypt[tw] OR united arab republic[tw] OR el salvador[tw] OR equatorial guinea[tw] OR spanish guinea[tw] OR eritrea[tw] OR estonia[tw] OR eswatini[tw] OR swaziland[tw] OR ethiopia[tw] OR fiji[tw] OR gabon[tw] OR gabonese republic[tw] OR gambia[tw] OR georgia[tw] OR georgian[tw] OR ghana[tw] OR gold coast[tw] OR gibraltar[tw] OR greece[tw] OR grenada[tw] OR guam[tw] OR guatemala[tw] OR guinea[tw] OR guyana[tw] OR guiana[tw] OR haiti[tw] OR hispaniola[tw] OR honduras[tw] OR hungary[tw] OR india[tw] OR indonesia[tw] OR timor[tw] OR iran[tw] OR iraq[tw] OR isle of man[tw] OR jamaica[tw] OR jordan[tw] OR	2,045,556

	kazakhstan[tw] OR kazakh[tw] OR kenya[tw] OR korea[tw] OR kosovo[tw] OR kyrgyzstan[tw] OR kirghizia[tw] OR kirgizstan[tw] OR kyrgyz republic[tw] OR kirghiz[tw] OR laos[tw] OR lao pdr[tw] OR lao people's democratic republic[tw] OR latvia[tw] OR lebanon[tw] OR lesotho[tw] OR basutoland[tw] OR liberia[tw] OR libya[tw] OR libyan arab jamahiriya[tw] OR lithuania[tw] OR macau[tw] OR macao[tw] OR macedonia[tw] OR madagascar[tw] OR malagasy republic[tw] OR malawi[tw] OR nyasaland[tw] OR malaysia[tw] OR maldives[tw] OR indian ocean[tw] OR mali[tw] OR malta[tw] OR micronesia[tw] OR kiribati[tw] OR marshall islands[tw] OR nauru[tw] OR northern mariana islands[tw] OR palau[tw] OR tuvalu[tw] OR mauritania[tw] OR mauritius[tw] OR mexico[tw] OR moldova[tw] OR moldovian[tw] OR mongolia[tw] OR montenegro[tw] OR morocco[tw] OR ifni[tw] OR mozambique[tw] OR portuguese east africa[tw] OR myanmar[tw] OR burma[tw] OR namibia[tw] OR nepal[tw] OR netherlands antilles[tw] OR nicaragua[tw] OR niger[tw] OR nigeria[tw] OR oman[tw] OR muscat[tw] OR pakistan[tw] OR panama[tw] OR papua new guinea[tw] OR paraguay[tw] OR peru[tw] OR philippines[tw] OR philipines[tw] OR phillipines[tw] OR phillippines[tw] OR poland[tw] OR polish people's republic[tw] OR portugal[tw] OR portuguese republic[tw] OR puerto rico[tw] OR romania[tw] OR russia[tw] OR russian federation[tw] OR ussr[tw] OR soviet union[tw] OR union of soviet socialist republics[tw] OR rwanda[tw] OR ruanda[tw] OR samoa[tw] OR pacific islands[tw] OR polynesia[tw] OR samoan islands[tw] OR sao tome and principe[tw] OR saudi arabia[tw] OR senegal[tw] OR serbia[tw] OR seychelles[tw] OR sierra leone[tw] OR slovakia[tw] OR slovak republic[tw] OR slovenia[tw] OR melanesia[tw] OR solomon island[tw] OR solomon islands[tw] OR norfolk island[tw] OR somalia[tw] OR south africa[tw] OR south sudan[tw] OR sri lanka[tw] OR ceylon[tw] OR saint kitts and nevis[tw] OR st kitts and nevis[tw] OR saint lucia[tw] OR st lucia[tw] OR saint vincent[tw] OR st vincent[tw] OR grenadines[tw] OR sudan[tw] OR suriname[tw] OR surinam[tw] OR syria[tw] OR syrian arab republic[tw] OR tajikistan[tw] OR tadjikistan[tw] OR tadzhikistan[tw] OR tadzhik[tw] OR tanzania[tw] OR tanganyika[tw] OR thailand[tw] OR siam[tw] OR timor leste[tw] OR east timor[tw] OR togo[tw] OR togolese republic[tw] OR tonga[tw] OR trinidad[tw] OR tobago[tw] OR tunisia[tw] OR turkey[tw] OR turkmenistan[tw] OR turkmen[tw] OR uganda[tw] OR ukraine[tw] OR uruguay[tw] OR uzbekistan[tw] OR uzbek[tw] OR vanuatu[tw] OR new hebrides[tw] OR venezuela[tw] OR vietnam[tw] OR viet nam[tw] OR middle east[tw] OR west bank[tw] OR gaza[tw] OR palestine[tw] OR yemen[tw] OR yugoslavia[tw] OR zambia[tw] OR zimbabwe[tw] OR northern rhodesia[tw] OR global south[tw]	

	OR africa south of the sahara[tw] OR sub saharan africa[tw] OR subsaharan africa[tw] OR central africa[tw] OR north africa[tw] OR northern africa[tw] OR magreb[tw] OR maghrib[tw] OR sahara[tw] OR southern africa[tw] OR east africa[tw] OR eastern africa[tw] OR west africa[tw] OR western africa[tw] OR west indies[tw] OR indian ocean islands[tw] OR caribbean[tw] OR central america[tw] OR latin america[tw] OR south america[tw] OR central asia[tw] OR north asia[tw] OR northern asia[tw] OR southeastern asia[tw] OR south eastern asia[tw] OR southeast asia[tw] OR south east asia[tw] OR western asia[tw] OR east europe[tw] OR eastern europe[tw] OR developing country[tw] OR developing countries[tw] OR developing nation[tw] OR developing nations[tw] OR developing population[tw] OR developing populations[tw] OR developing world[tw] OR less developed country[tw] OR less developed countries[tw] OR less developed nation[tw] OR less developed nations[tw] OR less developed world[tw] OR lesser developed countries[tw] OR lesser developed nations[tw] OR under developed country[tw] OR under developed countries[tw] OR under developed nations[tw] OR under developed world[tw] OR underdeveloped country[tw] OR underdeveloped countries[tw] OR underdeveloped nation[tw] OR underdeveloped nations[tw] OR underdeveloped population[tw] OR underdeveloped populations[tw] OR underdeveloped world[tw] OR middle income country[tw] OR middle income countries[tw] OR middle income nation[tw] OR middle income nations[tw] OR middle income population[tw] OR middle income populations[tw] OR low income country[tw] OR low income countries[tw] OR low income nation[tw] OR low income nations[tw] OR low income population[tw] OR low income populations[tw] OR lower income country[tw] OR lower income countries[tw] OR lower income nations[tw] OR lower income population[tw] OR lower income populations[tw] OR underserved countries[tw] OR underserved nations[tw] OR underserved population[tw] OR underserved populations[tw] OR under served population[tw] OR under served populations[tw] OR deprived countries[tw] OR deprived population[tw] OR deprived populations[tw] OR poor country[tw] OR poor countries[tw] OR poor nation[tw] OR poor nations[tw] OR poor population[tw] OR poor populations[tw] OR poor world[tw] OR poorer countries[tw] OR poorer nations[tw] OR poorer population[tw] OR poorer populations[tw] OR developing economy[tw] OR developing economies[tw] OR less developed economy[tw] OR less developed economies[tw] OR underdeveloped economies[tw] OR middle income economy[tw] OR middle income economies[tw] OR low income economy[tw] OR low income economies[tw] OR lower income economies[tw] OR low gdp[tw] OR low gnp[tw] OR low gross domestic[tw] OR	

	low gross national[tw] OR lower gdp[tw] OR lower gross domestic[tw] OR lmic[tw] OR lmics[tw] OR third world[tw] OR lami country[tw] OR lami countries[tw] OR transitional country[tw] OR transitional countries[tw] OR emerging economies[tw] OR emerging nation[tw] OR emerging nations[tw]	
8	6 OR 7	2,110,384
9	uptake[tiab] OR utilization[tiab] OR utilisation[tiab] OR participat*[tiab] OR “screening rate*”[tiab] OR increase*[tiab] OR improv*[tiab]	7,527,985
10	3 AND 4 AND 5 AND 8 AND 9 Filters: 10 years; English	272

Embase

No	Search Strategy	Hits
1	((“uterine cervix cancer”/de) OR (“uterine cervical cancer” OR “uterine cervix cancer” OR “cancer of the uterine cervix” OR “cervical intraepithelial neoplasia” OR "cervical neoplasm*" OR “cervical cancer*” OR “cervix cancer*” OR “cervix neoplasm*” OR "uterine cervical neoplasm*" OR “cancer of the cervix" OR "cervical dysplasia" OR "cervix dysplasia"):ti OR (“uterine cervical cancer” OR “uterine cervix cancer” OR “cancer of the uterine cervix” OR “cervical intraepithelial neoplasia” OR "cervical neoplasm*" OR “cervical cancer*” OR “cervix cancer*” OR “cervix neoplasm*” OR "uterine cervical neoplasm*" OR “cancer of the cervix" OR "cervical dysplasia" OR "cervix dysplasia"):ab)	121,752
2	((“breast tumor”/de) OR (“breast cancer*” OR “breast neoplasm*” OR “breast carcinoma*” OR “breast tumor*” OR “breast tumour*” OR “cancer of breast” OR “human mammary carcinoma” OR “malignant tumor of breast” OR “mammary cancer*”):ti OR (“breast cancer*” OR “breast neoplasm*” OR “breast carcinoma*” OR “breast tumor*” OR “breast tumour*” OR “cancer of breast” OR “human mammary carcinoma” OR “malignant tumor of breast” OR “mammary cancer*”):ab)	405,449
3	1 OR 2	601,111
4	((“mass screening”/de) OR (screening OR “early detection of disease” OR “early detection of disease” OR “early detection of cancer” OR "early diagnosis of cancer" “visual oral examination” OR “clinical oral examination”):ti OR (screening OR “early detection of disease” OR “early detection of disease” OR “early detection of cancer” OR "early diagnosis of cancer" OR “visual oral examination” OR “clinical oral examination”):ab)	716,013
5	((“randomized controlled trial”/de OR “quasi-experimental study”/de) OR (“randomized controlled trial*” OR “randomised controlled trial*” OR “randomised controlled stud*” OR “randomized controlled stud*” OR “controlled clinical trial” OR “quasi experimental stud*” OR	1,168,715

	“pretest-posttest” OR “non-randomized trial” OR “non-randomised trial” OR “nonrandomized trial” OR “nonrandomised trial” OR “controlled before-after studies” OR “interrupted time series studies” OR “non-randomized” OR “non-randomised” OR nonrandomized OR nonrandomised OR “cohort stud*” OR “observational stud*”):ti OR (“randomized controlled trial*” OR “randomised controlled trial*” OR “randomised controlled stud*” OR “randomized controlled stud*” OR “controlled clinical trial” “quasi experimental stud*” OR “pretest-posttest” OR “non-randomized trial” OR “non-randomised trial” OR “nonrandomized trial” OR “nonrandomised trial” OR “controlled before-after studies” OR “interrupted time series studies” OR “non-randomized” OR “non-randomised” OR nonrandomized OR nonrandomised OR “cohort stud*” OR “observational stud*”):ab)	
6	(Afghanistan OR Albania OR Algeria OR american samoa OR angola OR "antigua and barbuda" OR argentina OR Armenia OR aruba OR azerbaijan OR Bahrain OR Bangladesh OR Barbados OR Belarus OR belize OR benin OR bhutan OR bolivia OR "bosnia and herzegovina" OR botswana OR brazil OR bulgaria OR burkina faso OR burundi OR cape verde OR cambodia OR cameroon OR central african republic OR chad OR chile OR china OR colombia OR comoros OR democratic republic congo OR congo OR costa rica OR "cote d ivoire" OR croatia OR cuba OR cyprus OR czech republic OR djibouti OR dominica OR dominican republic OR ecuador OR egypt OR el salvador OR equatorial guinea OR eritrea OR estonia OR swaziland OR ethiopia OR fiji OR gabon OR gambia OR "georgia (republic)" OR ghana OR gibraltar OR greece OR grenada OR guam OR guatemala OR guinea OR guinea bissau OR guyana OR haiti OR honduras OR hungary OR india OR indonesia OR iran OR iraq OR isle of man OR jamaica OR jordan OR kazakhstan OR kenya OR north korea OR south korea OR korea OR kosovo OR kyrgyzstan OR laos OR latvia OR lebanon OR lesotho OR liberia OR libyan arab jamahiriya OR lithuania OR macau OR republic of north macedonia OR madagascar OR malawi OR malaysia OR indian ocean OR mali OR malta OR federated states of micronesia OR kiribati OR mauritania OR mauritius OR mexico OR moldova OR mongolia OR "montenegro (republic)" OR morocco OR mozambique OR myanmar OR namibia OR nepal OR netherlands antilles OR nicaragua OR niger OR nigeria OR oman OR pakistan OR panama OR papua new guinea OR paraguay OR peru OR philippines OR poland OR portugal OR puerto rico OR romania OR russian federation OR rwanda OR samoa OR "sao tome and principe" OR saudi arabia OR senegal OR serbia OR seychelles OR sierra leone OR slovakia OR slovenia OR melanesia OR somalia OR south africa OR south sudan OR sri lanka OR "saint kitts and nevis" OR saint lucia OR "saint vincent and the grenadines" OR sudan OR suriname OR syrian arab republic OR tajikistan OR tanzania OR thailand OR timor leste OR togo OR tonga OR "trinidad and tobago" OR tunisia OR "turkey republic" OR turkmenistan OR uganda OR	97,534

	ukraine OR uruguay OR uzbekistan OR vanuatu OR venezuela OR viet nam OR palestine OR yemen OR yugoslavia OR zambia OR zimbabwe OR africa south of the sahara OR africa, central OR africa, northern OR africa, southern OR africa, eastern OR africa, western OR west indies OR indian ocean islands OR caribbean region OR central america OR south america OR asia, central OR asia, northern OR asia, southeastern OR asia, western OR europe, eastern OR developing country):de	
7	(afghanistan OR albania OR algeria OR "american samoa" OR angola OR "antigua and barbuda" OR antigua OR barbuda OR argentina OR armenia OR armenian OR aruba OR azerbaijan OR bahrain OR bangladesh OR barbados OR republic of belarus OR belarus OR byelarus OR belorussia OR byelorussian OR belize OR "british honduras" OR benin OR dahomey OR bhutan OR bolivia OR "bosnia and herzegovina" OR bosnia OR herzegovina OR botswana OR bechuanaland OR brazil OR brasil OR bulgaria OR "burkina faso" OR "burkina fasso" OR "upper volta" OR burundi OR urundi OR "cabo verde" OR "cape verde" OR cambodia OR kampuchea OR khmer republic OR cameroon OR cameron OR cameroun OR "central african republic" OR "ubangi shari" OR chad OR chile OR china OR colombia OR comoros OR "comoro islands" OR "iles comores" OR mayotte OR "democratic republic of the congo" OR "democratic republic congo" OR congo OR zaire OR "costa rica" OR "cote dvoire" OR "cote d ivoire" OR "cote divoire" OR "cote d ivoire" OR "ivory coast" OR croatia OR cuba OR cyprus OR "czech republic" OR czechoslovakia OR djibouti OR "french somaliland" OR dominica OR "dominican republic" OR ecuador OR egypt OR "united arab republic" OR "el salvador" OR "equatorial guinea" OR "spanish guinea" OR eritrea OR estonia OR eswatini OR swaziland OR ethiopia OR fiji OR gabon OR "gabonese republic" OR gambia OR "georgia (republic)" OR georgian OR ghana OR “gold coast” OR gibraltar OR greece OR grenada OR guam OR guatemala OR guinea OR “guinea Bissau” OR guyana OR “british Guiana” OR haiti OR hispaniola OR honduras OR hungary OR india OR indonesia OR timor OR iran OR iraq OR "isle of man" OR jamaica OR jordan OR kazakhstan OR kazakh OR kenya OR "democratic peoples republic of korea" OR "republic of korea" OR "north korea" OR "south korea" OR korea OR kosovo OR kyrgyzstan OR kirghizia OR kirgizstan OR “kyrgyz republic” OR kirghiz OR laos OR lao pdr OR "lao peoples democratic republic" OR latvia OR lebanon OR "lebanese republic" OR lesotho OR basutoland OR liberia OR libya OR “libyan arab Jamahiriya” OR lithuania OR macau OR macao OR "republic of north macedonia" OR macedonia OR madagascar OR “malagasy republic” OR malawi OR nyasaland OR malaysia OR "malay federation" OR "malaya federation" OR maldives OR "indian ocean islands" OR "indian ocean" OR mali OR malta OR micronesia OR "federated states of micronesia" OR kiribati OR "marshall islands" OR nauru OR "northern mariana islands" OR palau OR tuvalu OR	860,485

	mauritania OR mauritius OR mexico OR moldova OR moldovian OR mongolia OR montenegro OR "montenegro republic" OR morocco OR ifni OR mozambique OR "portuguese east africa" OR myanmar OR burma OR namibia OR nepal OR "netherlands antilles" OR nicaragua OR niger OR nigeria OR oman OR muscat OR pakistan OR panama OR "papua new guinea" OR "new guinea" OR paraguay OR peru OR philippines OR philipines OR phillipines OR phillippines OR poland OR "polish peoples republic" OR portugal OR "portuguese republic" OR "puerto rico" OR romania OR russia OR "russian federation" OR ussr OR "soviet union" OR "union of soviet socialist republics" OR rwanda OR ruanda OR samoa OR "pacific islands" OR polynesia OR "samoan islands" OR "navigator island" OR "navigator islands" OR "sao tome and principe" OR "saudi arabia" OR senegal OR serbia OR seychelles OR "sierra leone" OR slovakia OR "slovak republic" OR slovenia OR melanesia OR "solomon island" OR "solomon islands" OR "norfolk island" OR "norfolk islands" OR somalia OR "south africa" OR "south sudan" OR "sri lanka" OR ceylon OR "saint kitts and nevis" OR "st. kitts and nevis" OR "saint lucia" OR "st. lucia" OR "saint vincent and the grenadines" OR "saint vincent" OR "st. vincent" OR grenadines OR sudan OR suriname OR surinam OR "dutch guiana" OR "netherlands guiana" OR syria OR "syrian arab republic" OR tajikistan OR tadjikistan OR tadzhikistan OR tadzhik OR tanzania OR tanganyika OR thailand OR siam OR "timor leste" OR "east timor" OR togo OR "togolese republic" OR tonga OR "trinidad and tobago" OR trinidad OR tobago OR tunisia OR "turkey (republic)" OR turkey OR turkmenistan OR turkmen OR uganda OR ukraine OR uruguay OR uzbekistan OR uzbek OR vanuatu OR "new hebrides" OR venezuela OR vietnam OR "viet nam" OR "middle east" OR "west bank" OR gaza OR palestine OR yemen OR yugoslavia OR zambia OR zimbabwe OR "northern rhodesia" OR "global south" OR "africa south of the sahara" OR "sub saharan africa" OR "subsaharan africa" OR "africa, central" OR "central africa" OR “africa, northern” OR “north Africa” OR “northern Africa” OR magreb OR maghrib OR sahara OR “africa, southern” OR “southern Africa” OR “africa, eastern” OR “east africa” OR “eastern Africa” OR “africa, western” OR “west Africa” OR “western Africa” OR “west indies” OR “indian ocean islands” OR “caribbean region” OR “caribbean islands” OR caribbean OR “central America” OR “latin America” OR "south and central america" OR “south America” OR “asia, central” OR “central asia” OR “asia, northern” OR “north asia” OR “northern asia” OR “asia, southeastern” OR “southeastern asia” OR “south eastern asia” OR “southeast asia” OR “south east asia” OR “asia, western” OR “western asia” OR “europe, eastern” OR “east Europe” OR “eastern Europe” OR “developing country” OR “developing countries” OR “developing nation? ” OR “developing population? ” OR “developing world” OR “less developed countr*” OR “less developed nation? ” OR “less developed population?” OR “less developed world” OR “lesser	

	developed countr*" OR "lesser developed nation? " OR "lesser developed population? " OR "lesser developed world" OR "under developed countr*" OR "under developed nation? " OR "under developed population? " OR "under developed world" OR "underdeveloped countr*" OR "underdeveloped nation? " OR "underdeveloped population? " OR "underdeveloped world" OR "middle income countr*" OR "middle income nation?" OR "middle income population?" OR "low income countr*" OR "low income nation?" OR "low income population?" OR "lower income countr*" OR "lower income nation?" OR "lower income population?" OR "underserved countr*" OR "underserved nation?" OR "underserved population?" OR "underserved world" OR "under served countr*" OR "under served nation?" OR "under served population?" OR "under served world" OR "deprived countr*" OR "deprived nation?" OR "deprived population?" OR "deprived world" OR "poor countr*" OR "poor nation?" OR "poor population?" OR "poor world" OR "poorer countr*" OR "poorer nation?" OR "poorer population?" OR "poorer world" OR "developing econom*" OR "less developed econom*" OR "lesser developed econom*" OR "under developed econom*" OR "underdeveloped econom*" OR "middle income econom*" OR "low income econom*" OR "lower income econom*" OR "low gdp" OR "low gnp" OR "low gross domestic" OR "low gross national" OR "lower gdp" OR "lower gnp" OR "lower gross domestic" OR "lower gross national" OR lmic OR lmics OR "third world" OR "lami countr*" OR "transitional countr*" OR "emerging economies" OR "emerging nation? "):ti,ab,kw	
8	6 OR 7	903,603
9	((uptake OR utilization OR utilisation OR participat* OR "screening rate*" OR increase OR improve):ti OR (uptake OR utilization OR utilisation OR participat* OR "screening rate*" OR increase OR improve):ab)	4,994,584
10	3 AND 4 AND 5 AND 8 AND 9 AND [english]/lim AND [humans]/lim AND [embase]/lim AND [2010-2020]/py	96

Appendix 3: Search strategies for primary studies (diabetes, hypertension, and oral cancer only)

PubMed

No	Search Strategy	Hits
1	(diabetes mellitus[MeSH] OR diabet*[tiab] OR "T2DM"[tiab])	708,829
2	(Hypertension[MeSH] OR hypertension[tiab] OR "elevated blood pressure"[tiab])	480,516
3	(mouth neoplasm[tiab] OR mouth neoplasms[MeSH] OR "oral neoplasm" [tiab] OR "oral neoplasms"[tiab] OR "oral cancer"[tiab]	73,882

	OR “oral cancers”[tiab] OR “cancer of mouth”[tiab] OR “mouth cancer”[tiab])	
4	1 OR 2 OR 3	1,168,804
5	(mass screening[MeSH] OR screening[tiab] OR “early detection of disease”[tiab] OR “urinary glucose”[tiab] OR “urine glucose”[tiab] OR “venous fasting plasma glucose”[tiab] OR “fasting capillary blood glucose”[tiab] OR “glycated haemoglobin”[tiab] OR “glycated hemoglobin”[tiab] OR early detection of cancer[MeSH] OR "cancer early detection"[tiab] OR "early diagnosis of cancer"[tiab] OR “visual oral examination”[tiab] OR “clinical oral examination”[tiab])	611,858
6	“randomized controlled trial*”[tiab] OR “randomized controlled trials as topic”[MeSH] OR “clinical trial*”[tiab] OR “randomised controlled stud*”[tiab] OR “randomized controlled stud*”[tiab] OR “randomised controlled trial*”[tiab] OR “non-randomized controlled trials as topic”[MeSH] OR “quasi-experimental stud*”[tiab] OR “pretest-posttest”[tiab] OR “non-randomized trial”[tiab] OR “non-randomised trial”[tiab] OR “nonrandomized trial”[tiab] OR “nonrandomised trial”[tiab] OR “controlled before-after studies”[tiab] OR “interrupted time series studies”[tiab] OR “non-randomized”[tw] OR “non-randomised”[tw] OR nonrandomized[tw] OR nonrandomised[tw] OR “cohort stud*”[tw] OR “observational stud*”[tw]	1,230,566
7	((("semi-structured"[tiab] OR semistructured[tiab] OR unstructured[tiab] OR informal[tiab] OR "in-depth"[tiab] OR indepth[tiab] OR "face-to-face"[tiab] OR structured[tiab] OR guide[tiab] OR guides[tiab]) AND (interview*[tiab] OR discussion*[tiab] OR questionnaire*[tiab])) OR ("focus group"[tiab] OR "focus groups"[tiab] OR qualitative[tiab] OR ethnograph*[tiab] OR fieldwork[tiab] OR "field work"[tiab] OR "key informant"[tiab])) OR "interviews as topic"[MeSH] OR "focus groups"[MeSH] OR "narration"[MeSH] OR "qualitative research"[MeSH] OR "personal narratives as topic"[MeSH] OR (theme[tiab] OR thematic[tiab]) OR "ethnological research"[tiab] OR phenomenol*[tiab] OR "grounded theory"[tiab] OR "grounded study"[tiab] OR "grounded studies"[tiab] OR "grounded research"[tiab] OR "grounded analysis"[tiab] OR "grounded analyses"[tiab] OR "life story"[tiab] OR "life stories"[tiab] OR hermeneutics[tiab] OR heuristic*[tiab] OR semiotic[tiab] OR "data saturation"[tiab] OR "participant observation"[tiab] OR "action research"[tiab] OR "cooperative inquiry"[tiab] OR "co-operative inquiry"[tiab] OR "field study"[tiab] OR "field studies"[tiab] OR "field research"[tiab] OR "theoretical sample"[tiab] OR "theoretical sampling"[tiab] OR "purposive sampling"[tiab] OR "purposive sample"[tiab] OR "purposive samples"[tiab] OR "lived experience"[tiab] OR "lived experiences"[tiab] OR "purposive sampling"[tiab] OR "content analysis"[tiab] OR discourse[tiab] OR	535,156

	"narrative analysis"[tiab] OR heidegger*[tiab] OR colaizzi[tiab] OR spiegelberg[tiab] OR "van manen*"[tiab] OR "van kaam"[tiab] OR "merleau ponty"[tiab] OR husserl*[tiab] OR Foucault[tiab] OR Corbin[tiab] OR Strauss[tiab] OR Glaser[tiab]	
8	6 OR 7	1,158,981
9	afghanistan[MeSH] OR albania[MeSH] OR algeria[MeSH] OR american samoa[MeSH] OR angola[MeSH] OR antigua and barbuda[MeSH] OR argentina[MeSH] OR armenia[MeSH] OR aruba[MeSH] OR azerbaijan[MeSH] OR bahrain[MeSH] OR bangladesh[MeSH] OR barbados[MeSH] OR republic of belarus[MeSH] OR belize[MeSH] OR benin[MeSH] OR bhutan[MeSH] OR bolivia[MeSH] OR bosnia and herzegovina[MeSH] OR botswana[MeSH] OR brazil[MeSH] OR bulgaria[MeSH] OR burkina faso[MeSH] OR burundi[MeSH] OR cabo verde[MeSH] OR cambodia[MeSH] OR cameroon[MeSH] OR central african republic[MeSH] OR chad[MeSH] OR chile[MeSH] OR china[MeSH] OR colombia[MeSH] OR comoros[MeSH] OR democratic republic of the congo[MeSH] OR congo[MeSH] OR costa rica[MeSH] OR cote d'ivoire[MeSH] OR croatia[MeSH] OR cuba[MeSH] OR cyprus[MeSH] OR czech republic[MeSH] OR djibouti[MeSH] OR dominica[MeSH] OR dominican republic[MeSH] OR ecuador[MeSH] OR egypt[MeSH] OR el salvador[MeSH] OR equatorial guinea[MeSH] OR eritrea[MeSH] OR estonia[MeSH] OR swaziland[MeSH] OR ethiopia[MeSH] OR fiji[MeSH] OR gabon[MeSH] OR gambia[MeSH] OR georgia (republic)[MeSH] OR ghana[MeSH] OR gibraltar[MeSH] OR greece[MeSH] OR grenada[MeSH] OR guam[MeSH] OR guatemala[MeSH] OR guinea[MeSH] OR guinea bissau[MeSH] OR guyana[MeSH] OR haiti[MeSH] OR honduras[MeSH] OR hungary[MeSH] OR india[MeSH] OR indonesia[MeSH] OR iran[MeSH] OR iraq[MeSH] OR jamaica[MeSH] OR jordan[MeSH] OR kazakhstan[MeSH] OR kenya[MeSH] OR democratic people's republic of korea[MeSH] OR republic of korea[MeSH] OR kosovo[MeSH] OR kyrgyzstan[MeSH] OR laos[MeSH] OR latvia[MeSH] OR lebanon[MeSH] OR lesotho[MeSH] OR liberia[MeSH] OR libya[MeSH] OR lithuania[MeSH] OR macau[MeSH] OR republic of north macedonia[MeSH] OR madagascar[MeSH] OR malawi[MeSH] OR malaysia[MeSH] OR indian ocean islands[MeSH] OR mali[MeSH] OR malta[MeSH] OR micronesia[MeSH] OR palau[MeSH] OR mauritania[MeSH] OR mauritius[MeSH] OR mexico[MeSH] OR moldova[MeSH] OR mongolia[MeSH] OR montenegro[MeSH] OR morocco[MeSH] OR mozambique[MeSH] OR myanmar[MeSH] OR namibia[MeSH] OR nepal[MeSH] OR netherlands antilles[MeSH] OR nicaragua[MeSH] OR niger[MeSH] OR nigeria[MeSH] OR oman[MeSH] OR pakistan[MeSH] OR panama[MeSH] OR papua	1,363,365

	new guinea[MeSH] OR paraguay[MeSH] OR peru[MeSH] OR philippines[MeSH] OR poland[MeSH] OR portugal[MeSH] OR puerto rico[MeSH] OR romania[MeSH] OR russia[MeSH] OR rwanda[MeSH] OR samoa[MeSH] OR sao tome and principe[MeSH] OR saudi arabia[MeSH] OR senegal[MeSH] OR serbia[MeSH] OR seychelles[MeSH] OR sierra leone[MeSH] OR slovakia[MeSH] OR slovenia[MeSH] OR melanesia[MeSH] OR somalia[MeSH] OR south africa[MeSH] OR south sudan[MeSH] OR sri lanka[MeSH] OR saint kitts and nevis[MeSH] OR saint lucia[MeSH] OR saint vincent and the grenadines[MeSH] OR sudan[MeSH] OR suriname[MeSH] OR syria[MeSH] OR tajikistan[MeSH] OR tanzania[MeSH] OR thailand[MeSH] OR timor leste[MeSH] OR togo[MeSH] OR tonga[MeSH] OR trinidad and tobago[MeSH] OR tunisia[MeSH] OR turkey[MeSH] OR turkmenistan[MeSH] OR uganda[MeSH] OR ukraine[MeSH] OR uruguay[MeSH] OR uzbekistan[MeSH] OR vanuatu[MeSH] OR venezuela[MeSH] OR vietnam[MeSH] OR middle east[MeSH] OR yemen[MeSH] OR yugoslavia[MeSH] OR zambia[MeSH] OR zimbabwe[MeSH] OR africa south of the sahara[MeSH] OR africa, central[MeSH] OR africa, northern[MeSH] OR africa, southern[MeSH] OR africa, eastern[MeSH] OR africa, western[MeSH] OR west indies[MeSH] OR indian ocean islands[MeSH] OR caribbean region[MeSH] OR central america[MeSH] OR latin america[MeSH] OR south america[MeSH] OR asia, central[MeSH] OR asia, northern[MeSH] OR asia, southeastern[MeSH] OR asia, western[MeSH] OR europe, eastern[MeSH] OR developing countries[MeSH]	
10	afghanistan[tw] OR albania[tw] OR algeria[tw] OR american samoa[tw] OR angola[tw] OR antigua[tw] OR barbuda[tw] OR argentina[tw] OR armenia[tw] OR armenian[tw] OR aruba[tw] OR azerbaijan[tw] OR bahrain[tw] OR bangladesh[tw] OR barbados[tw] OR belarus[tw] OR byelarus[tw] OR belorussia[tw] OR byelorussian[tw] OR belize[tw] OR british honduras[tw] OR benin[tw] OR dahomey[tw] OR bhutan[tw] OR bolivia[tw] OR bosnia[tw] OR herzegovina[tw] OR botswana[tw] OR bechuanaland[tw] OR brazil[tw] OR brasil[tw] OR bulgaria[tw] OR burkina faso[tw] OR burkina fasso[tw] OR upper volta[tw] OR burundi[tw] OR urundi[tw] OR cabo verde[tw] OR cape verde[tw] OR cambodia[tw] OR kampuchea[tw] OR khmer republic[tw] OR cameroon[tw] OR cameron[tw] OR cameroun[tw] OR central african republic[tw] OR ubangi shari[tw] OR chad[tw] OR chile[tw] OR china[tw] OR colombia[tw] OR comoros[tw] OR comoro islands[tw] OR mayotte[tw] OR congo[tw] OR zaire[tw] OR costa rica[tw] OR cote d'ivoire[tw] OR cote d' ivoire[tw] OR cote divoire[tw] OR cote d ivoire[tw] OR ivory coast[tw] OR croatia[tw] OR cuba[tw]	2,040,449

	OR cyprus[tw] OR czech republic[tw] OR czechoslovakia[tw] OR djibouti[tw] OR french somaliland[tw] OR dominica[tw] OR dominican republic[tw] OR ecuador[tw] OR egypt[tw] OR united arab republic[tw] OR el salvador[tw] OR equatorial guinea[tw] OR spanish guinea[tw] OR eritrea[tw] OR estonia[tw] OR eswatini[tw] OR swaziland[tw] OR ethiopia[tw] OR fiji[tw] OR gabon[tw] OR gabonese republic[tw] OR gambia[tw] OR georgia[tw] OR georgian[tw] OR ghana[tw] OR gold coast[tw] OR gibraltar[tw] OR greece[tw] OR grenada[tw] OR guam[tw] OR guatemala[tw] OR guinea[tw] OR guyana[tw] OR guiana[tw] OR haiti[tw] OR hispaniola[tw] OR honduras[tw] OR hungary[tw] OR india[tw] OR indonesia[tw] OR timor[tw] OR iran[tw] OR iraq[tw] OR isle of man[tw] OR jamaica[tw] OR jordan[tw] OR kazakhstan[tw] OR kazakh[tw] OR kenya[tw] OR korea[tw] OR kosovo[tw] OR kyrgyzstan[tw] OR kirghizia[tw] OR kirgizstan[tw] OR kyrgyz republic[tw] OR kirghiz[tw] OR laos[tw] OR lao pdr[tw] OR lao people's democratic republic[tw] OR latvia[tw] OR lebanon[tw] OR lesotho[tw] OR basutoland[tw] OR liberia[tw] OR libya[tw] OR libyan arab jamahiriya[tw] OR lithuania[tw] OR macau[tw] OR macao[tw] OR macedonia[tw] OR madagascar[tw] OR malagasy republic[tw] OR malawi[tw] OR nyasaland[tw] OR malaysia[tw] OR maldives[tw] OR indian ocean[tw] OR mali[tw] OR malta[tw] OR micronesia[tw] OR kiribati[tw] OR marshall islands[tw] OR nauru[tw] OR northern mariana islands[tw] OR palau[tw] OR tuvalu[tw] OR mauritania[tw] OR mauritius[tw] OR mexico[tw] OR moldova[tw] OR moldovian[tw] OR mongolia[tw] OR montenegro[tw] OR morocco[tw] OR ifni[tw] OR mozambique[tw] OR portuguese east africa[tw] OR myanmar[tw] OR burma[tw] OR namibia[tw] OR nepal[tw] OR netherlands antilles[tw] OR nicaragua[tw] OR niger[tw] OR nigeria[tw] OR oman[tw] OR muscat[tw] OR pakistan[tw] OR panama[tw] OR papua new guinea[tw] OR paraguay[tw] OR peru[tw] OR philippines[tw] OR philipines[tw] OR phillipines[tw] OR phillippines[tw] OR poland[tw] OR polish people's republic[tw] OR portugal[tw] OR portuguese republic[tw] OR puerto rico[tw] OR romania[tw] OR russia[tw] OR russian federation[tw] OR ussr[tw] OR soviet union[tw] OR union of soviet socialist republics[tw] OR rwanda[tw] OR ruanda[tw] OR samoa[tw] OR pacific islands[tw] OR polynesia[tw] OR samoan islands[tw] OR sao tome and principe[tw] OR saudi arabia[tw] OR senegal[tw] OR serbia[tw] OR seychelles[tw] OR sierra leone[tw] OR slovakia[tw] OR slovak republic[tw] OR slovenia[tw] OR melanesia[tw] OR solomon island[tw] OR solomon islands[tw] OR norfolk island[tw] OR somalia[tw] OR south africa[tw] OR south sudan[tw] OR sri lanka[tw] OR ceylon[tw] OR saint kitts and nevis[tw] OR st kitts and nevis[tw] OR saint lucia[tw] OR st lucia[tw] OR saint vincent[tw] OR st	

	vincent[tw] OR grenadines[tw] OR sudan[tw] OR suriname[tw] OR surinam[tw] OR syria[tw] OR syrian arab republic[tw] OR tajikistan[tw] OR tadjikistan[tw] OR tadzhikistan[tw] OR tadzhik[tw] OR tanzania[tw] OR tanganyika[tw] OR thailand[tw] OR siam[tw] OR timor leste[tw] OR east timor[tw] OR togo[tw] OR togolese republic[tw] OR tonga[tw] OR trinidad[tw] OR tobago[tw] OR tunisia[tw] OR turkey[tw] OR turkmenistan[tw] OR turkmen[tw] OR uganda[tw] OR ukraine[tw] OR uruguay[tw] OR uzbekistan[tw] OR uzbek[tw] OR vanuatu[tw] OR new hebrides[tw] OR venezuela[tw] OR vietnam[tw] OR viet nam[tw] OR middle east[tw] OR west bank[tw] OR gaza[tw] OR palestine[tw] OR yemen[tw] OR yugoslavia[tw] OR zambia[tw] OR zimbabwe[tw] OR northern rhodesia[tw] OR global south[tw] OR africa south of the sahara[tw] OR sub saharan africa[tw] OR subsaharan africa[tw] OR central africa[tw] OR north africa[tw] OR northern africa[tw] OR magreb[tw] OR maghrib[tw] OR sahara[tw] OR southern africa[tw] OR east africa[tw] OR eastern africa[tw] OR west africa[tw] OR western africa[tw] OR west indies[tw] OR indian ocean islands[tw] OR caribbean[tw] OR central america[tw] OR latin america[tw] OR south america[tw] OR central asia[tw] OR north asia[tw] OR northern asia[tw] OR southeastern asia[tw] OR south eastern asia[tw] OR southeast asia[tw] OR south east asia[tw] OR western asia[tw] OR east europe[tw] OR eastern europe[tw] OR developing country[tw] OR developing countries[tw] OR developing nation[tw] OR developing nations[tw] OR developing population[tw] OR developing populations[tw] OR developing world[tw] OR less developed country[tw] OR less developed countries[tw] OR less developed nation[tw] OR less developed nations[tw] OR less developed world[tw] OR lesser developed countries[tw] OR lesser developed nations[tw] OR under developed country[tw] OR under developed countries[tw] OR under developed nations[tw] OR under developed world[tw] OR underdeveloped country[tw] OR underdeveloped countries[tw] OR underdeveloped nation[tw] OR underdeveloped nations[tw] OR underdeveloped population[tw] OR underdeveloped populations[tw] OR underdeveloped world[tw] OR middle income country[tw] OR middle income countries[tw] OR middle income nation[tw] OR middle income nations[tw] OR middle income population[tw] OR middle income populations[tw] OR low income country[tw] OR low income countries[tw] OR low income nation[tw] OR low income nations[tw] OR low income population[tw] OR low income populations[tw] OR lower income country[tw] OR lower income countries[tw] OR lower income nations[tw] OR lower income population[tw] OR lower income populations[tw] OR underserved countries[tw] OR underserved nations[tw] OR underserved population[tw] OR underserved	

	populations[tw] OR under served population[tw] OR under served populations[tw] OR deprived countries[tw] OR deprived population[tw] OR deprived populations[tw] OR poor country[tw] OR poor countries[tw] OR poor nation[tw] OR poor nations[tw] OR poor population[tw] OR poor populations[tw] OR poor world[tw] OR poorer countries[tw] OR poorer nations[tw] OR poorer population[tw] OR poorer populations[tw] OR developing economy[tw] OR developing economies[tw] OR less developed economy[tw] OR less developed economies[tw] OR underdeveloped economies[tw] OR middle income economy[tw] OR middle income economies[tw] OR low income economy[tw] OR low income economies[tw] OR lower income economies[tw] OR low gdp[tw] OR low gnp[tw] OR low gross domestic[tw] OR low gross national[tw] OR lower gdp[tw] OR lower gross domestic[tw] OR lmic[tw] OR lmics[tw] OR third world[tw] OR lami country[tw] OR lami countries[tw] OR transitional country[tw] OR transitional countries[tw] OR emerging economies[tw] OR emerging nation[tw] OR emerging nations[tw]	
11	9 OR 10	2,105,181
12	uptake[tiab] OR utilization[tiab] OR utilisation[tiab] OR participat*[tiab] OR “screening rate*”[tiab] OR increase*[tiab] OR improv*[tiab]	7,510,309
13	4 AND 5 AND 6 AND 11 AND 12 Filters: 10 years; English	203

Embase

No	Search Strategy	Hits
1	((“diabetes mellitus“/de) OR (diabet* OR “T2DM”):ti OR (diabet* OR “T2DM”):ab)	1,110,184
2	((“elevated blood pressure”/de) OR (hypertension OR “elevated blood pressure”):ti OR (hypertension OR “elevated blood pressure”):ab)	607,276
3	((“mouth cancer”/de) OR (“mouth neoplasm*” OR “oral neoplasm*” OR “oral cancer*” OR “cancer of mouth” OR “mouth cancer*”):ti OR (“mouth neoplasm*” OR “oral neoplasm*” OR “oral cancer*” OR “cancer of mouth” OR “mouth cancer*”):ab)	25,574
4	1 OR 2 OR 3	1,587,577
5	((“mass screening”/de) OR (screening OR “early detection of disease” OR “urinary glucose” OR “urine glucose” OR “venous fasting plasma glucose” OR “fasting capillary blood glucose” OR “glycated haemoglobin” OR “glycated hemoglobin” OR “early detection of disease” OR “early detection of cancer” OR "early diagnosis of cancer" “visual oral examination” OR “clinical oral examination”):ti OR (screening OR “early detection of disease” OR “urinary glucose” OR “urine glucose” OR “venous fasting plasma glucose” OR “fasting capillary blood glucose” OR “glycated haemoglobin” OR “glycated hemoglobin” OR “early detection of disease” OR “early detection of	731,657

	cancer” OR "early diagnosis of cancer" OR “visual oral examination” OR “clinical oral examination”):ab)	
6	((“randomized controlled trial”/de OR “quasi-experimental study”/de) OR (“randomized controlled trial*” OR “randomised controlled trial*” OR “randomised controlled stud*” OR “randomized controlled stud*” OR “controlled clinical trial” OR “quasi experimental stud*” OR “pretest-posttest” OR “non-randomized trial” OR “non-randomised trial” OR “nonrandomized trial” OR “nonrandomised trial” OR “controlled before-after studies” OR “interrupted time series studies” OR “non-randomized” OR “non-randomised” OR nonrandomized OR nonrandomised OR “cohort stud*” OR “observational stud*”):ti OR (“randomized controlled trial*” OR “randomised controlled trial*” OR “randomised controlled stud*” OR “randomized controlled stud*” OR “controlled clinical trial” “quasi experimental stud*” OR “pretest-posttest” OR “non-randomized trial” OR “non-randomised trial” OR “nonrandomized trial” OR “nonrandomised trial” OR “controlled before-after studies” OR “interrupted time series studies” OR “non-randomized” OR “non-randomised” OR nonrandomized OR nonrandomised OR “cohort stud*” OR “observational stud*”):ab)	1,182,149
7	((("semi-structured" OR semistructured OR unstructured OR informal OR "in-depth" OR indepth OR "face-to-face" OR structured OR guide OR guides) AND (interview* OR discussion* OR questionnaire*)) OR ("focus group" OR "focus groups" OR qualitative OR ethnograph* OR fieldwork OR "field work" OR "key informant")) OR (interview/de OR "qualitative research"/de) OR (interview OR "focus groups" OR "narration" OR “qualitative research” OR "personal narratives as topic" OR (theme OR thematic) OR "ethnological research" OR phenomenol* OR "grounded theory" OR "grounded study" OR "grounded studies" OR "grounded research" OR "grounded analysis" OR "grounded analyses" OR "life story" OR "life stories" OR hermeneutics OR heuristic* OR semiotic OR "data saturation" OR "participant observation" OR "action research" OR "cooperative inquiry" OR "co-operative inquiry" OR "field study" OR "field studies" OR "field research" OR "theoretical sample" OR "theoretical sampling" OR "purposive sampling" OR "purposive sample" OR "purposive samples" OR "lived experience" OR "lived experiences" OR "purposive sampling" OR "content analysis" OR discourse OR "narrative analysis" OR heidegger* OR colaizzi OR spiegelberg OR "van manen*" OR "van kaam" OR "merleau ponty" OR husserl* OR Foucault OR Corbin OR Strauss OR Glaser):ti OR ((("semi-structured" OR semistructured OR unstructured OR informal OR "in-depth" OR indepth OR "face-to-face" OR structured OR guide OR guides) AND (interview* OR discussion* OR questionnaire*)) OR ("focus group" OR "focus groups" OR qualitative OR ethnograph* OR fieldwork OR "field work" OR "key informant")) OR (interview OR "focus groups" OR "narration" OR “qualitative research” OR "personal narratives as topic" OR (theme OR thematic) OR "ethnological research" OR	849,151

	phenomenol* OR "grounded theory" OR "grounded study" OR "grounded studies" OR "grounded research" OR "grounded analysis" OR "grounded analyses" OR "life story" OR "life stories" OR hermeneutics OR heuristic* OR semiotic OR "data saturation" OR "participant observation" OR "action research" OR "cooperative inquiry" OR "co-operative inquiry" OR "field study" OR "field studies" OR "field research" OR "theoretical sample" OR "theoretical sampling" OR "purposive sampling" OR "purposive sample" OR "purposive samples" OR "lived experience" OR "lived experiences" OR "purposive sampling" OR "content analysis" OR discourse OR "narrative analysis" OR heidegger* OR colaizzi OR spiegelberg OR "van manen*" OR "van kaam" OR "merleau ponty" OR husserl* OR Foucault OR Corbin OR Strauss OR Glaser):ab	
8	6 OR 7	1,490,783
9	(Afghanistan OR Albania OR Algeria OR american samoa OR angola OR "antigua and barbuda" OR argentina OR Armenia OR aruba OR azerbaijan OR Bahrain OR Bangladesh OR Barbados OR Belarus OR belize OR benin OR bhutan OR bolivia OR "bosnia and herzegovina" OR botswana OR brazil OR bulgaria OR burkina faso OR burundi OR cape verde OR cambodia OR cameroon OR central african republic OR chad OR chile OR china OR colombia OR comoros OR democratic republic congo OR congo OR costa rica OR "cote d ivoire" OR croatia OR cuba OR cyprus OR czech republic OR djibouti OR dominica OR dominican republic OR ecuador OR egypt OR el salvador OR equatorial guinea OR eritrea OR estonia OR swaziland OR ethiopia OR fiji OR gabon OR gambia OR "georgia (republic)" OR ghana OR gibraltar OR greece OR grenada OR guam OR guatemala OR guinea OR guinea bissau OR guyana OR haiti OR honduras OR hungary OR india OR indonesia OR iran OR iraq OR isle of man OR jamaica OR jordan OR kazakhstan OR kenya OR north korea OR south korea OR korea OR kosovo OR kyrgyzstan OR laos OR latvia OR lebanon OR lesotho OR liberia OR libyan arab jamahiriya OR lithuania OR macau OR republic of north macedonia OR madagascar OR malawi OR malaysia OR indian ocean OR mali OR malta OR federated states of micronesia OR kiribati OR mauritania OR mauritius OR mexico OR moldova OR mongolia OR "montenegro (republic)" OR morocco OR mozambique OR myanmar OR namibia OR nepal OR netherlands antilles OR nicaragua OR niger OR nigeria OR oman OR pakistan OR panama OR papua new guinea OR paraguay OR peru OR philippines OR poland OR portugal OR puerto rico OR romania OR russian federation OR rwanda OR samoa OR "sao tome and principe" OR saudi arabia OR senegal OR serbia OR seychelles OR sierra leone OR slovakia OR slovenia OR melanesia OR somalia OR south africa OR south sudan OR sri lanka OR "saint kitts and nevis" OR saint lucia OR "saint vincent and the grenadines" OR sudan OR suriname OR syrian arab republic OR tajikistan OR tanzania OR thailand OR timor leste OR togo OR tonga OR "trinidad and tobago"	97,473

	OR tunisia OR "turkey republic" OR turkmenistan OR uganda OR ukraine OR uruguay OR uzbekistan OR vanuatu OR venezuela OR viet nam OR palestine OR yemen OR yugoslavia OR zambia OR zimbabwe OR africa south of the sahara OR africa, central OR africa, northern OR africa, southern OR africa, eastern OR africa, western OR west indies OR indian ocean islands OR caribbean region OR central america OR south america OR asia, central OR asia, northern OR asia, southeastern OR asia, western OR europe, eastern OR developing country):de	
10	(afghanistan OR albania OR algeria OR "american samoa" OR angola OR "antigua and barbuda" OR antigua OR barbuda OR argentina OR armenia OR armenian OR aruba OR azerbaijan OR bahrain OR bangladesh OR barbados OR republic of belarus OR belarus OR byelarus OR belorussia OR byelorussian OR belize OR "british honduras" OR benin OR dahomey OR bhutan OR bolivia OR "bosnia and herzegovina" OR bosnia OR herzegovina OR botswana OR bechuanaland OR brazil OR brasil OR bulgaria OR "burkina faso" OR "burkina fasso" OR "upper volta" OR burundi OR urundi OR "cabo verde" OR "cape verde" OR cambodia OR kampuchea OR khmer republic OR cameroon OR cameron OR cameroun OR "central african republic" OR "ubangi shari" OR chad OR chile OR china OR colombia OR comoros OR "comoro islands" OR "iles comores" OR mayotte OR "democratic republic of the congo" OR "democratic republic congo" OR congo OR zaire OR "costa rica" OR "cote dvoire" OR "cote d ivoire" OR "cote divoire" OR "cote d ivoire" OR "ivory coast" OR croatia OR cuba OR cyprus OR "czech republic" OR czechoslovakia OR djibouti OR "french somaliland" OR dominica OR "dominican republic" OR ecuador OR egypt OR "united arab republic" OR "el salvador" OR "equatorial guinea" OR "spanish guinea" OR eritrea OR estonia OR eswatini OR swaziland OR ethiopia OR fiji OR gabon OR "gabonese republic" OR gambia OR "georgia (republic)" OR georgian OR ghana OR “gold coast” OR gibraltar OR greece OR grenada OR guam OR guatemala OR guinea OR “guinea Bissau” OR guyana OR “british Guiana” OR haiti OR hispaniola OR honduras OR hungary OR india OR indonesia OR timor OR iran OR iraq OR "isle of man" OR jamaica OR jordan OR kazakhstan OR kazakh OR kenya OR "democratic peoples republic of korea" OR "republic of korea" OR "north korea" OR "south korea" OR korea OR kosovo OR kyrgyzstan OR kirghizia OR kirgizstan OR “kyrgyz republic” OR kirghiz OR laos OR lao pdr OR "lao peoples democratic republic" OR latvia OR lebanon OR "lebanese republic" OR lesotho OR basutoland OR liberia OR libya OR “libyan arab Jamahiriya” OR lithuania OR macau OR macao OR "republic of north macedonia" OR macedonia OR madagascar OR “malagasy republic” OR malawi OR nyasaland OR malaysia OR "malay federation" OR "malaya federation" OR maldives OR "indian ocean islands" OR "indian ocean" OR mali OR malta OR micronesia OR "federated states of micronesia" OR kiribati OR "marshall islands"	858,634

	OR nauru OR "northern mariana islands" OR palau OR tuvalu OR mauritania OR mauritius OR mexico OR moldova OR moldovian OR mongolia OR montenegro OR "montenegro republic" OR morocco OR ifni OR mozambique OR "portuguese east africa" OR myanmar OR burma OR namibia OR nepal OR "netherlands antilles" OR nicaragua OR niger OR nigeria OR oman OR muscat OR pakistan OR panama OR "papua new guinea" OR "new guinea" OR paraguay OR peru OR philippines OR philipines OR phillipines OR phillippines OR poland OR "polish peoples republic" OR portugal OR "portuguese republic" OR "puerto rico" OR romania OR russia OR "russian federation" OR ussr OR "soviet union" OR "union of soviet socialist republics" OR rwanda OR ruanda OR samoa OR "pacific islands" OR polynesia OR "samoan islands" OR "navigator island" OR "navigator islands" OR "sao tome and principe" OR "saudi arabia" OR senegal OR serbia OR seychelles OR "sierra leone" OR slovakia OR "slovak republic" OR slovenia OR melanesia OR "solomon island" OR "solomon islands" OR "norfolk island" OR "norfolk islands" OR somalia OR "south africa" OR "south sudan" OR "sri lanka" OR ceylon OR "saint kitts and nevis" OR "st. kitts and nevis" OR "saint lucia" OR "st. lucia" OR "saint vincent and the grenadines" OR "saint vincent" OR "st. vincent" OR grenadines OR sudan OR suriname OR surinam OR "dutch guiana" OR "netherlands guiana" OR syria OR "syrian arab republic" OR tajikistan OR tadjikistan OR tadzhikistan OR tadzhik OR tanzania OR tanganyika OR thailand OR siam OR "timor leste" OR "east timor" OR togo OR "togolese republic" OR tonga OR "trinidad and tobago" OR trinidad OR tobago OR tunisia OR "turkey (republic)" OR turkey OR turkmenistan OR turkmen OR uganda OR ukraine OR uruguay OR uzbekistan OR uzbek OR vanuatu OR "new hebrides" OR venezuela OR vietnam OR "viet nam" OR "middle east" OR "west bank" OR gaza OR palestine OR yemen OR yugoslavia OR zambia OR zimbabwe OR "northern rhodesia" OR "global south" OR "africa south of the sahara" OR "sub saharan africa" OR "subsaharan africa" OR "africa, central" OR "central africa" OR “africa, northern” OR “north Africa” OR “northern Africa” OR magreb OR maghrib OR sahara OR “africa, southern” OR “southern Africa” OR “africa, eastern” OR “east africa” OR “eastern Africa” OR “africa, western” OR “west Africa” OR “western Africa” OR “west indies” OR “indian ocean islands” OR “caribbean region” OR “caribbean islands” OR caribbean OR “central America” OR “latin America” OR "south and central america" OR “south America” OR “asia, central” OR “central asia” OR “asia, northern” OR “north asia” OR “northern asia” OR “asia, southeastern” OR “southeastern asia” OR “south eastern asia” OR “southeast asia” OR “south east asia” OR “asia, western” OR “western asia” OR “europe, eastern” OR “east Europe” OR “eastern Europe” OR “developing country” OR “developing countries” OR “developing nation? ” OR “developing population? ” OR “developing world” OR “less developed countr*” OR “less developed nation? ” OR “less	

	developed population?" OR "less developed world" OR "lesser developed countr*" OR "lesser developed nation? " OR "lesser developed population? " OR "lesser developed world" OR "under developed countr*" OR "under developed nation? " OR "under developed population? " OR "under developed world" OR "underdeveloped countr*" OR "underdeveloped nation? " OR "underdeveloped population? " OR "underdeveloped world" OR "middle income countr*" OR "middle income nation?" OR "middle income population?" OR "low income countr*" OR "low income nation?" OR "low income population?" OR "lower income countr*" OR "lower income nation?" OR "lower income population?" OR "underserved countr*" OR "underserved nation?" OR "underserved population?" OR "underserved world" OR "under served countr*" OR "under served nation?" OR "under served population?" OR "under served world" OR "deprived countr*" OR "deprived nation?" OR "deprived population?" OR "deprived world" OR "poor countr*" OR "poor nation?" OR "poor population?" OR "poor world" OR "poorer countr*" OR "poorer nation?" OR "poorer population?" OR "poorer world" OR "developing econom*" OR "less developed econom*" OR "lesser developed econom*" OR "under developed econom*" OR "underdeveloped econom*" OR "middle income econom*" OR "low income econom*" OR "lower income econom*" OR "low gdp" OR "low gnp" OR "low gross domestic" OR "low gross national" OR "lower gdp" OR "lower gnp" OR "lower gross domestic" OR "lower gross national" OR lmic OR lmics OR "third world" OR "lami countr*" OR "transitional countr*" OR "emerging economies" OR "emerging nation? "):ti,ab,kw	
11	9 OR 10	901,745
12	((uptake OR utilization OR utilisation OR participat* OR "screening rate*" OR increase OR improve):ti OR (uptake OR utilization OR utilisation OR participat* OR "screening rate*" OR increase OR improve):ab)	4,985,711
13	4 AND 5 AND 6 AND 11 AND 12 AND [english]/lim AND [humans]/lim AND [embase]/lim AND [2010-2020]/py	45

Appendix 4 – PRISMA flow charts

Figure 1 PRISMA study selection flow chart for systematic reviews

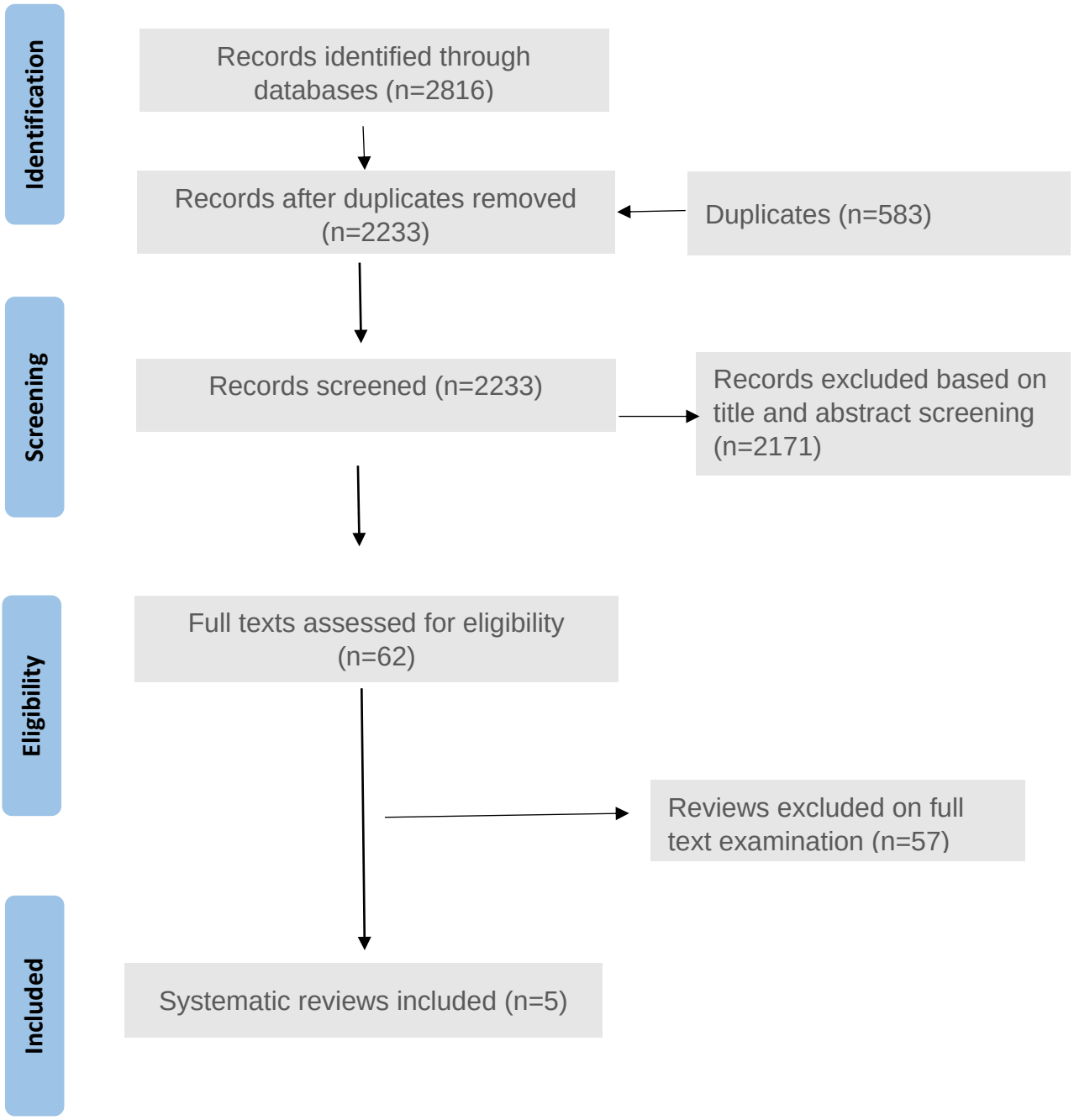


Figure 2 PRISMA study selection flow chart for primary studies (cervical and breast cancers)

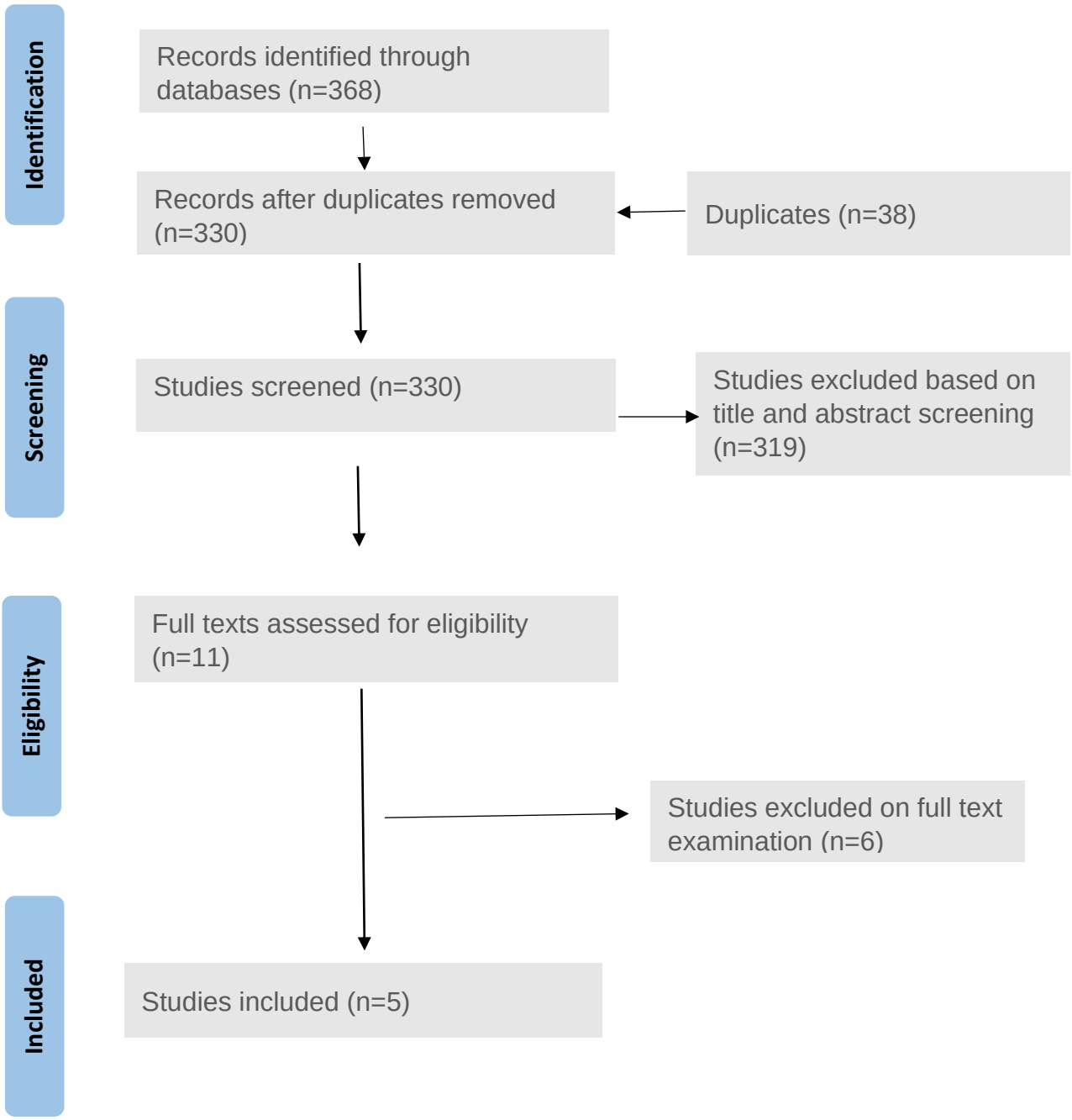
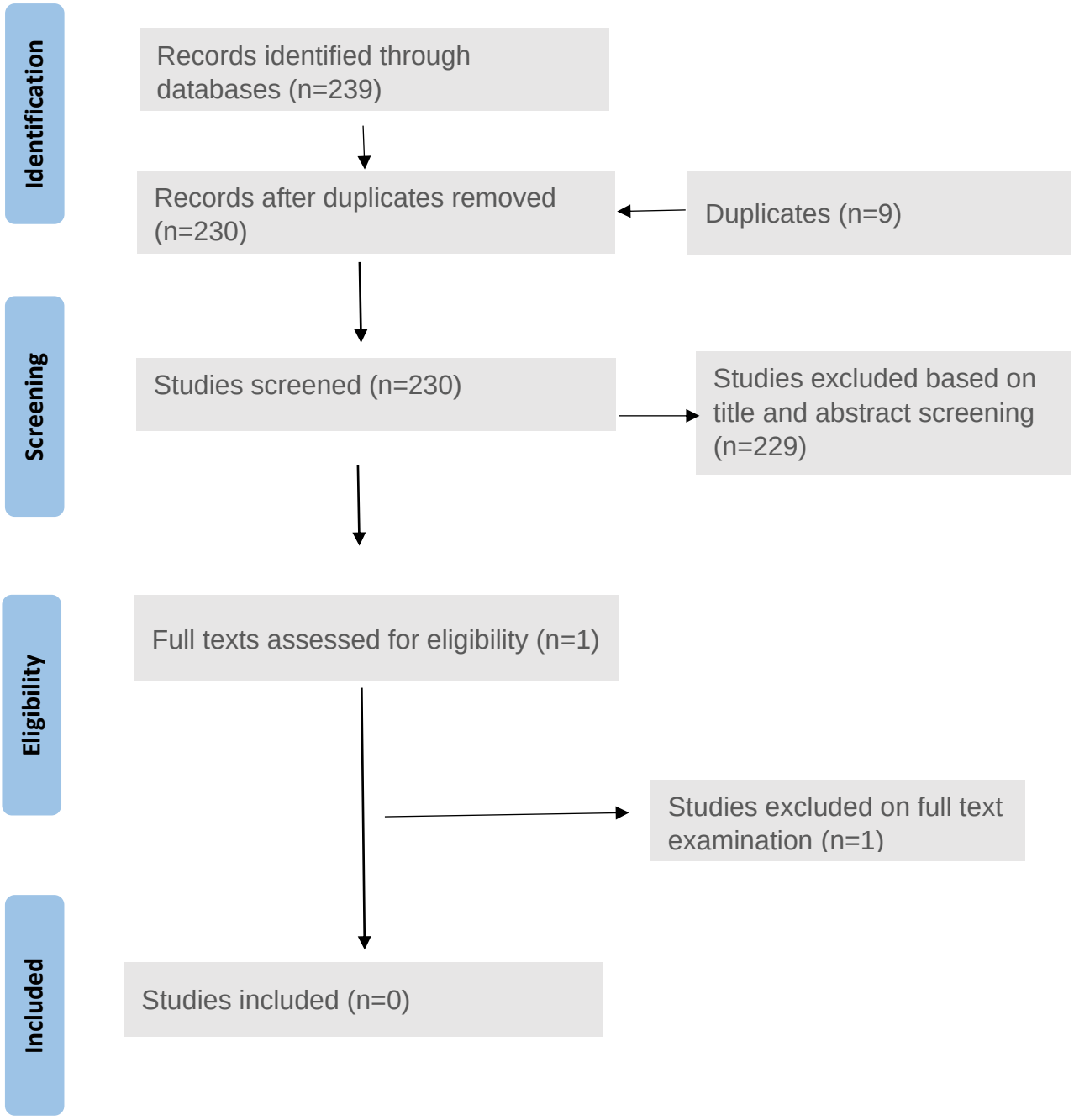


Figure 3 PRISMA study selection flow chart for primary studies (diabetes, hypertension, and oral cancer only)



Appendix 5: List of excluded systematic reviews with reasons for exclusion

Systematic reviews that included studies conducted in HICs or UMICs

1. Agide FD, Garmaroudi G, Sadeghi R, Shakibazadeh E, Yaseri M, Koricha ZB, et al. A systematic review of the effectiveness of health education interventions to increase cervical cancer screening uptake. Eur J Public Health. 2018;28(6):1156-62.
2. Albrow R, Blomberg K, Kitchener H, Brabin L, Patnick J, Tishelman C, et al. Interventions to improve cervical cancer screening uptake amongst young women: A systematic review. Acta Oncologica. 2014;53(4):445-51.
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Appendix 6: List of excluded primary studies with reasons for exclusion

1. Asgary R, Staderini N, Mthethwa-Hleta S, Lopez Saavedra PA, Garcia Abrego L, Rusch B, et al. Evaluating smartphone strategies for reliability, reproducibility, and quality of VIA for cervical cancer screening in the Shiselweni region of Eswatini: A cohort study. PLoS Med. 2020;17(11):e1003378.
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Appendix 7: List of excluded primary studies with reasons for exclusion (diabetes hypertension and oral cancer)

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