Barriers and enablers to screening uptake for hypertension, diabetes, oral, breast and cervical cancers in adult patients over 30 years 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

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Competing interests

The authors do not have any relevant competing interests.

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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 behaviours factors.(1) Main types of NCDs are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease (COPD), 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)

The Ministry of Health and Family Welfare (MoHFW) under the Ayushman Bharat Comprehensive Primary Healthcare (CPHC) program has undertaken a population-based screening program for all men and women over 30 years with NCDs, 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).(6) Under Comprehensive Primary Health Care (CPHC) and to complement existing NPCDCS, Universal Screening of NCDs for individuals aged 30 years and above, was designed and implemented in the beginning of year 2017 to expand the range of services to be delivered.(7-9) The key components of this programme include population enumeration, community-based risk assessment through use of a checklist by Accredited Social Health Activists (ASHAs), health promotion, sub-centre level screening by Auxiliary Nurse Midwives (ANMs) and treatment initiation by PHC-Medical Officer (MO), and ensuring continuum of care through referral, medicine dispensation and a two way follow up at Sub Health Centres (SHCs).(7-9) Implementation of universal screening, prevention and management of common NCDs initiative was reported to be at different stages in different states.(8)

This rapid review focussed on identifying and synthesising evidence on barriers and enablers for screening uptake related to oral, breast and cervical cancers, hypertension, and diabetes, within the LMIC context. The enablers and barriers from lower-middle-income countries are likely to be very different from high-income and upper-middle income countries, hence, we conducted a rapid review of studies from LMICs.

This review is complemented by another rapid review that aimed to examine evidence on interventions designed to increase screening uptake in 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, with the following NCDs: breast cancer, cervical cancer, oral cancer, diabetes, and hypertension. Additionally, healthcare providers who are involved in provision and delivery of screening were also included.

Intervention

Interventions that seek to increase screening uptake.

Phenomenon of interest

Identifying enablers and barriers to screening uptake in urban areas.

Context

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

Study designs

Mixed-methods systematic reviews including before and after studies, cohort studies, cross-sectional studies, qualitative studies and mixed-methods studies that document and explore the barriers and enablers in the conduct of NCD screening in urban areas were included. In the absence of systematic reviews on any of the NCDs of interest and/or enablers and barriers, primary studies (aforementioned study designs) conducted 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 and 2) 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 LIMC 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). Where multiple systematic reviews exploring enablers and barriers in similar target populations were available, the most recent and high-quality systematic review/s were included. The 2020-2021 World Bank country income classification was used to identify and include relevant studies from LMICs.(10)

Assessment of risk of bias in included studies

Risk of bias assessment was not performed.

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. Reported barriers and enablers influencing uptake and/or utilisation of screening services were grouped and coded respectively into major themes. The most common recurring themes were derived from the systematic reviews and were placed into overarching categories. This involved identifying themes and grouping similar themes together.

3. Results

Search results and study selection

The database searches for systematic reviews (SRs) for all the NCDs of interest identified 911 records. After removal of 174 duplicates, we screened 737 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, eight SRs were included in this report.(11-18) Figure 1 (Appendix 3) shows the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow chart for SRs. The list of excluded SRs (n=54/62) with reasons for exclusion at the full text level is presented in Appendix 4. Almost all of the excluded SRs included primary studies that were conducted in upper-middle income countries (UMICs) and high-income countries (HICs)

The database searches for primary studies of interest for diabetes, hypertension and oral cancer were performed, as there were no systematic reviews available. The searches identified 273, and on study selection process, five studies were finally included. Figure 2 (Appendix 3) shows the PRISMA flow chart for primary studies relevant to diabetes, hypertension and oral cancer. The list of excluded SRs (n=6/11) with reasons for exclusion at the full text level is presented in Appendix 5.

Characteristics of included studies

Overall, eight SRs related to cervical and breast cancer screening were included in the report. The majority of the evidence was around barriers and enablers or facilitators for cervical cancer screening (CCS) uptake. Five SRs specifically reported on barriers and enablers for CCS uptake.(12, 13, 15, 16, 18) One out of those five SRs was specific to CCS uptake in HIV-positive women.(15) Two SRs,(14, 17) including one conference abstract(17) of a SR (published in 2020) explored barriers and enablers for both cervical and breast cancer screening uptake. One other SR identified barriers to breast cancer screening (BCS) uptake that was specific to South India context.(11) Four SRs were specific to sub-Saharan Africa context.(12, 16-18) And the rest of the SRs included studies from low and low-and-middle income countries,(11, 13-15) The primary studies included in the SRs were mainly quantitative in nature, with many being cross-sectional surveys, followed by qualitative studies, and some mixed-methods studies.

Majority of the evidence from the included primary studies in the SRs was concentrated in the sub-Saharan Africa region, with very few studies from South Asia. Countries where studies were conducted included Bangladesh, Botswana, Ethiopia, Ghana, India, Ivory Coast (Cote d'Ivoire), Kenya, Malawi, Morocco, Nigeria, South Africa, Tanzania, Uganda, and Zambia.

The SRs identified similar barriers and enablers for both CCS and BCS uptake, with a few factors specific to CCS uptake. All the SRs explicitly reported on patient-related barriers and enablers for CCS and BCS uptake. None of the SRs reported on provider-related barriers and enablers. Table 1 presents the overarching categories and the themes identified from various SRs, in relation to patient-reported barriers and enablers, for CCS and BCS uptake. Table 1 presents a summary of the overarching categories and the themes identified from various SRs, in relation to health care provider (HCP)-reported barriers and enablers, for CCS and BCS uptake. Barriers and enablers that were specific to CCS are clearly identified in the Tables. Common screening methods for CCS reported in the SRs included visual inspection with acetic acid (VIA), Human Papilloma Virus (HPV) self-collection, and cytology. Common screening methods for BCS included breast self-examination (BSE), clinical breast examination (CBE), and mammography.

Five primary studies were identified and included that reported on barriers and enablers for uptake of screening for oral cancer, diabetes and hypertension.(19-23) The characteristics of the included studies are summarised in Tables 2 and 3 for each NCD of interest.

Table 1 Categories and themes of patient-reported barriers and enablers

Overarching category	Barrier themes	Enabler themes
Personal factors		
Knowledge and awareness	Lack of education on cancer and/or screening services	Adequate knowledge of cervical and breast cancer and CCS and BCS services
	Lack of knowledge on cancer and/or screening services	Well informed by HCPs regarding cancer and screening
	Poor awareness of preventive opportunities, including screening services	
	Screening is unnecessary. Women who have insufficient knowledge about the disease showed little concern about screening	
	Lack of awareness and misinformation associated with misconceptions	
	Misinformation	
Stigma	Self or internalised stigma. (E.g. patients' feelings about themselves as they try to access screening services, including the experience of shame related to undergoing screening procedures)	
Embarrassment	Embarrassment or shame of showing private parts of body, especially if the HCP conducting screening is a male	
Fear	Fear of the screening procedure	
	Fear of screening outcome/fear of getting diagnosed with cancer	
	Fear of painful pelvic examination, bleeding or contracting diseases through CCS	
	Fatalistic view of a positive outcome of the screening	

Experiences and beliefs	Negative experience with prior screening	Positive experience with prior screening
	Belief that only symptomatic women need to undergo CCS	Experiencing signs and symptoms of cervical and breast cancer
	Belief of virginity loss during CCS	Greater perceived susceptibility of being at risk of cervical cancer
	Screening is a painful procedure	
Other factors	Not being married (BCS)	
	Being pregnant or in peripartum period	
	Current medical illnesses (such as advanced stage of AIDS, diabetes or hypertension, etc.) and health priorities other than cancer	
Socio-cultural factors		
Stigma	Social stigma (E.g. fear of judgment from others if they knew patient or not wanting to be seen at a screening service centre)	
	Negative connotation about a woman, as CCS involves pelvic examination and may sometimes be combined with treatment for reproductive or sexually transmitted infection	
Screening experiences and beliefs	Negative experience with prior screening providers	Support from HCPs
	Personal or family experiences with CCS	
Social support	Negative attitude of spouse or family members	Positive social support from peers and family
		Encouragement from family members to attend screening, particularly spousal encouragement
		Being recommended to attend screening by a HCP

Patient and HCP relationship	Negative attitude of HCPs, particularly towards HIV-positive adults	Positive attitude of HCPs particularly towards HIV-positive adults
Religious beliefs and values	Modesty mostly associated with religion	
	Other religious factors – traditional healers (Traditional healers accessed over HCPs due to misconceptions about cancer causes)	
Structural/Health systems factors		
Knowledge and awareness	Lack of information regarding direction of where and when to obtain service	
	Lack of trained HCPs	
Embarrassment	Male gender of the HCP performing the screening procedure	
Logistics	Rigid scheduling structure, frequent appointments (negative experience)	Flexible scheduling structure (positive experience)
	Limited access to screening services	Community outreach services
	Long wait time	Residing in urban or semi-urban areas
	Lack of transportation	Convenience in terms of accessibility (location, opening times) and integration with other existing health services (e.g. reproductive or HIV care)
	Long distance to hospital/screening centres equipped with required laboratory facilities	Close proximity to health facility or a screening centre
	Insufficient medical advice from HCPs	
	Difficulty in navigating health care facilities and services	
Resources and/or infrastructure	Lack of or limited facilities/health infrastructure needed to carry out screening procedures	Having a dedicated room in the clinic that affords privacy
	Understaffing	

Resources and/or infrastructure	Screening procedure is expensive	Free screening services
	Out-of-pocket payment for non-emergency health services like screening service	Financial incentives to cover transportation costs to screening centres
	Additional cost of transportation to access screening services	

HCP – Health care provider; CCS – Cervical cancer screening; BCS – Breast cancer screening

Barriers and enablers to cervical and breast cancer screening uptake

A summary of the barriers and enablers to cervical and breast cancer screening uptake is provided in the following section. Majority of the evidence focussed on CCS(12-18) but most of the barriers and enablers were identified as being common to both types of cancers,(11-18) with a few specific identified for CCS.

Barriers

Personal factors

Knowledge and awareness

Knowledge of cancers and cancer screening services, and attitudes toward cervical cancer and screening were the most commonly reported barriers in all the SRs.(11-18) Included studies in the SRs revealed that women who had insufficient knowledge about cancers showed little concern about screening. Further, it was reported that poor awareness of cervical and breast cancer and screening opportunities affected uptake. HIV-positive women with low knowledge of cervical cancer and cervical cancer screening were less likely to undergo screening.

Beliefs and perceptions

The belief that only symptomatic women need to undergo cancer screening was the next most frequently reported barrier. The low perceived susceptibility of cancer, especially cervical cancer was associated with a decreased uptake of cancer screening in most of the included studies. Another common barrier to screening uptake reported was the fatalistic view of a positive outcome of the screening. Lack of awareness and misinformation were also associated with misconception about cancer screening. In a few include studies, it was reported that women perceived CCS as an unnecessary thing for unmarried women.(14, 15) Belief of virginity loss was the least reported barrier among them.

Embarrassment

Almost all the SRs reported embarrassment or shyness as a barrier during cancer screening procedures.(12-18) Embarrassment or shame of showing private parts of body and particularly pelvic examination were among the main reasons for not seeking CCS services. Additionally, the male gender of the healthcare provider (HCP) performing cancer screening was reported as a barrier in screening uptake, in general, and in particular by HIV-positive women.

Fear

Fear of screening procedure and fear of results or outcome of the screening (i.e. diagnosed with cancer) was another commonly reported barrier in all the included SRs. In most of the cases, particularly in CCS, this was related to the fear of painful pelvic examination, bleeding or contracting diseases through cervical cancer screening. In

all the studies, the majority of the participants did not avail screening services, as they perceived the procedure to be painful.

Stigma

Fear of cancer-related stigma was another barrier for availing cancer screening services, as reported in three SRs.(14-16) Particularly, in women with HIV, the stigma and concerns regarding HIV status disclosure were reported as barriers to cervical cancer screening.(15)

Being symptomatic

Being asymptomatic was identified as a barrier to cancer screening in a large number of studies in the included SRs, as it was incorrectly perceived that a lack of symptoms was a sign of well-being.(12-17)

Other self-reported personal factors

Being pregnant or in peripartum period was a barrier to cervical cancer screening. Current medical illnesses (e.g. HIV/AIDS, diabetes or hypertension, etc.) and health priorities other than cancer were considered as barriers to screening uptake, more so by HIV positive women.(14, 15, 17)

Sociocultural factors

Social support

Lack of family support (e.g. husband's disapproval or condemnation for planning to undergo screening procedure) was the most frequently reported barrier. In addition, other family members' support, social stigma/stigmatisation, prior personal or family experiences with cancer screening services were reported as the major socio-cultural barriers.(12-16, 18) In many low-income countries in sub-Saharan Africa, patriarchal practice was an important barrier to take up cervical cancer screening, which was financially and culturally related too.(16) As stated in the SR, in most African communities, the man is regarded as the head of the family and therefore, any important decision regarding the family is made solely by him, which is a barrier for most women for availing CCS services.(16)

Patient–HCP relationship

The effectiveness of the patient–HCP relationship was acknowledged as having a significant effect on CCS uptake. Poor patient-HCP relationship and negative attitude of HCPs toward HIV-positive women were considered a barrier toward cancer screening uptake, especially with CCS uptake.(13-16)

Stigma

Several SRs reported that women who reported negative attitude of their husband or spouse towards cancer screening were less likely to undergo screening.(11, 13-16) In one SR, it was reported that women in sub-Saharan Africa generally face stigmatisation and embarrassment if they discuss or attempt to access CCS services.(16) Further, as cervical screening involves pelvic examination and may be

combined with treatment for reproductive or sexually transmitted infection, it may result in a negative connotation about a woman.(16)

Other self-reported social factors

Religious beliefs and values appeared to influence the uptake of cancer screening services, as reported in a few SRs.(14-16) Some of the recurring themes included: family does not allow screening, modesty associated with religion, and that believing the disease is caused by a curse.

Structural/Health systems factors

Long waiting time

Lack of time for procedure and/or belief that the procedure was time consuming was the most frequently reported structural barrier in most of the SRs.(12-16) Long waiting times in clinics or hospitals (particularly public health facilities) that provide screening services was seen as a major barrier in availing screening services.(13-16) Time limitations and long waiting time at clinics were noted as barriers by a majority of women in most of the reviews. (13-16)

Screening costs

Screening cost was reported as another major barrier to accessing cancer screening services in almost all the included SRs.(11-16, 18) In regions where poverty is high and there are many other priority health issues, out-of-pocket payment for non-emergency health services such as cervical and breast cancer screening services is reported to be a major barrier to utilisation faced by most women. (11-16, 18)

Transportation

Lack of transportation to the CCS procedure centre and insufficient medical advice from health care providers were the least reported barrier among structural barriers.(11-16, 18) Additional cost of transportation to access services was also reported to decrease screening uptake.(12-16)

Accessibility

Several SRs reported that cancer screening centres were far to reach for many participants from their residences/locations.(12-16) Additionally, not knowing a place where cancer screening was done or being out of catchment of a healthcare facility providing screening services were among barriers to uptake of CCS.(13, 15, 16) Difficulty in navigating health care facility and services; lack of information regarding direction of where and when to obtain service were some of the other barriers reported that deterred some women from accessing screening services.(12-16)

Resources/infrastructures

Lack of facilities needed for cancer screening and understaffing were seen as some of the major barriers in terms of the physical and human resources (supervision, retention) required. (12-16) Convenience of cancer screening, in terms of accessibility (location, opening times) and integration with other existing health services (e.g.

reproductive or HIV care) were some of the other commonly reported structural barriers.(12-16) Perceived quality of screening (having a dedicated room in the clinic, privacy, staff professionalism etc.) were reported as significant determinants of patient satisfaction and uptake.

Attitudes of health workers

Negative attitudes of health care providers (HCPs) towards women, particularly towards HIV-positive women was reported as another important barrier towards utilisation of cancer screening service. (12-16)

Enablers

Personal factors

Adequate knowledge

Adequate knowledge of cancer and cancer screening services was associated with higher rates of cancer screening uptake by patients.(12-16)

Beliefs and perceptions

Greater perceived susceptibility of cervical and breast cancer was associated with an increased uptake of cervical cancer screening by study subjects.(12-16) Previous positive experience of cancer screening was reported as a facilitator for undergoing subsequent cervical cancer screenings.

Socio-cultural factors

Support

Women who were well informed by their HCPs regarding cancer and screening methods were more likely avail screening services. Encouragement from friends and family members to attend screening, particularly spousal encouragement, was considered as an important motivator for women.(12, 15, 17)

Location

Convenience of cancer screening, in terms of accessibility (location, opening times) has a positive effect on service uptake, as reported in several SRs.(12, 15, 17, 18) Women from urban areas were more likely to have been screened if they had prior knowledge about cancer.(12, 15, 17)

Structural/Health systems factors

Screening costs and integration with existing health services

Free screening opportunity was associated with an increased interest of women to get screened, especially for cervical cancer.(15, 16) Women from urban areas were more likely to have been screened if they had some form of health insurance.(12, 15, 17) Integration with other existing health services (e.g. reproductive or family planning or HIV care) has a positive effect on service uptake.(13-17)

Table 2 Characteristics of included systematic reviews on barriers and enablers to 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	Barriers (participants' and providers')	Enablers (participants' and providers')
Cervical cancer					
Black et al 2019(12)	Number of studies: 14 Study Designs: Mixed methods, quantitative and qualitative studies Countries: Uganda Setting: Both urban and rural populations Follow-up: Not specified	Sample Size: 13 to 900 Gender: female Age: varied between 15 to 65 years Type of NCDs: Cervical Cancer	Not Specified	Perceived Barriers (Participants): 1.Poor knowledge of Cervical Cancer (CC) &CCS; 2.Low perceived risk of CC 3..CC not considered significant 4.Embarrassment & Stigma 5. Lack of privacy 6.. Fear of screening & outcome 7. Lack of financial / emotional support from spouse 8.Traditional healers accessed over HCWs 9.Older age 10. Residing in a remote or rural area	Enablers/facilitators: (Participants) 1. Knowledge of CC & CCS 2. Perceived risk of CC 3. Experiencing signs / symptoms of CC 4. Family or spousal support 5. Personal / family experiences with CC or CCS 6. Recommended to attend Screening 7. Age > 25 years 8. Postsecondary or greater education 9. Higher income &

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	Barriers (participants' and providers')	Enablers (participants' and providers')
				11.Limited access to CCS facility 12. No time / long wait times 13.Perceiving HCWs as rude & lack of trained HCWs Perceived Barriers (Health Care providers): 1. Low perceived risk of CC 2. Limited resources and health infrastructure	formal employment 10. Living with spouse 11. Smaller household size 12. Residing in urban or semi urban areas 13. Access to health facility where CCS offered 14. Community Outreach
Devarapalli et al 2018(13)	Number of studies: 31 Study Designs: Cross sectional studies Countries: Ethiopia, India, Tanzania, Nigeria, Kenya, El Salvador, Jamaica, Bangladesh,	Sample Size: 97 to 5929 Gender: female Age: varied between 15 to 70 years Type of NCDs: Cervical Cancer	Not Specified	Perceived Barriers (Participants): 1. Barriers of lack of knowledge and awareness 2. Psychological barriers-screening were painful, fear and anxiety 3. Structural barriers-Lack of time, expensive	

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	Barriers (participants' and providers')	Enablers (participants' and providers')
	Setting: Both urban and rural populations Follow-up: Not specified			CCS procedure, transportation issues. 4. Sociocultural and religious barriers- lack of family support (husband's disapproval or condemnation of patients planning to undergo CC screening procedure), religious barrier- trust in God	
Kasraeian et al 2020(15)	Number of studies:32 Study Designs: Cross sectional and mixed methods Countries: Nigeria, Ivory Coast, Ghana, South Africa, Botswana,	Sample Size: varied between 100 to 1991 women. Gender: Women, HIV positive women Age: Varied between 17-84 years Type of NCDs:	Pap test, VIA	1. low awareness of cervical cancer 2. low perception about being at risk of cervical cancer among HIV-positive women 3. low awareness of pap-smear	1. given enough information about HPV, cervical cancer, and screening before the screening. 2. perceived benefits of CCS 3. perceived Seriousness of cervical cancer

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	Barriers (participants' and providers')	Enablers (participants' and providers')
	Ethiopia, Zimbabwe, Tanzania, Uganda.	Cervical Cancer		among HIV-positive women . 4. bad attitude of nurses 5. discouraged by partner 6. too expensive 7.Need to obtain partner's approval 8.Religious denial 9.Being informed on cervical cancer at the HIV clinic 10. Fear 11. understaffing, long waiting time. 12.Misunderstanding of cervical cancer screening 13. being pregnant or in peripartum period 14. fear of test result 15.Not enough cervical cancer screening services available	4. cues about cervical cancer screening. 5. women reported that they would have cervical cancer screening again if it was free. 6. offered to them by HCP. 7. partner or husband support

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	Barriers (participants' and providers')	Enablers (participants' and providers')
Lim et al 2017(16)	Number of studies: 8 Study Designs: Qualitative and Mixed Methods studies Countries: Ghana, Uganda, Kenya, Nigeria, Zambia, Uganda Settings: Both urban and rural	Sample Size: varied between 16 to 420 Gender: Women Age: Not explicitly mentioned Type of NCDs: Cervical Cancer	Not captured	Barriers: Participants' 1. fear of pain from the procedure and of outcome; 2. poor knowledge of cancer and screening; financial constraint, 3. cultural and psychological barriers 4. profound social consequences and possibility of exclusion Physical Access: 5. Lack of facility for screening 7. Health facility distance, navigation issues 8.Cost of transportation 9. Services not easily accessible Cultural issues:	Not captured

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	Barriers (participants' and providers')	Enablers (participants' and providers')
				10. Shame of sickness 11. Fatalistic view 12.Stigmatisation Modesty 13.Embarrassed with procedure 14.Privacy and embarrassment 15. Cultural constraints about expression. 16. Gender of care giver Misconceptions 17. Misconception about disease and screening 18. Procedure can cause cervical cancer and infection from other diseases 19. Spousal support & Household work 20.Health care worker attitude Financial constraints	

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	Barriers (participants' and providers')	Enablers (participants' and providers')
				21. Cost of screening 22. Cost of transportation	
Runge et al 2019(18)	Number of studies: 15 Study Designs: Mixed methods and cross-sectional studies were included. Countries: India, Mozambique, Peru, Tanzania, Zimbabwe, Malawi, Bangladesh, Kenya, Honduras, Indonesia, Nigeria, Botswana, Latin America Setting: Both urban and rural populations	Sample Size: varied between 335 to 7449 Gender: Women, HIV positive women Age: Not explicitly mentioned Type of NCDs: Cervical Cancer	VIA and Cryotherapy	Structural: 1.Lack of resources 2.Lack of facilities 3.Unreliable power sources Systemic 1.Lack of education 2.Scarcity of trained healthcare providers 3.Competing health needs Socioeconomic 1.Rural communities 2.Lack of transportation to screening clinics 3.Financial limitations Sociocultural 1.Stigmata of diagnosis 2.Fear of screening 3.Fear of vaccination	Women from urban areas were more likely to have been screened if they were older, had some form of health insurance, or had prior knowledge about cervical cancer.

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	Barriers (participants' and providers')	Enablers (participants' and providers')
Both cervical and breast cancers					
Islam et al 2017(14)	Number of studies: 15 Study Designs: Mixed methods and cross-sectional studies were included. Countries: Peru, Mozambique, India, Tanzania, Zimbabwe, Malawi, Bangladesh, Kenya, Honduras, Indonesia, Nigeria, Botswana, Latin America, Setting: Both urban and rural populations Follow-up: Not specified	Sample Size: 10 to 40 Gender: female, healthcare workers, Men Age: mean age varied between 21 and 45 years Type of NCDs: Cervical Cancer	Cervical Cancer: VIA, Pap Smear, Cryotherapy, VILLI, Colposcopy, Breast Cancer: BSE, CBE, Mammography	Cervical Cancer: (generalized) 1. lack of awareness of, and knowledge about CC and CC screening 2. Screening uptake was also lower among multiparous Mozambican women and in women who believe that CC is caused by a curse/witchcraft. 3. education, income and cost associated with screening and treatment, distance to the service centres, access and availability to screening. 4. lack of Understanding of the role of screening 5. fear, anxiety, and depression 6. partner's attitude Breast Cancer	Cervical Cancer: Women who attended screening service were older, listened regularly to the radio, had a poorer quality of life, had health insurance or faced cost barriers to obtaining health care in the preceding year, and held a more positive attitude towards CC screening compared with women who did not attend

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	Barriers (participants' and providers')	Enablers (participants' and providers')
				1. All studies reported that lack of knowledge and awareness about breast cancer 2. demographic and personal factors such as not being married, fear and anxiety 3. Access, availability and cost.	
Pantelli et al 2020(17)	Number of studies: 6 Study Designs: Cohort, Qualitative and cross-sectional studies Countries: Malawi Setting: Urban and rural settings	Sample Size: Varied between 120 and 145,015 women. Gender: Women, Healthcare providers and HIV positive women Age: Not explicitly reported Type of NCDs: Breast and	Not explicitly mentioned	Participants' expressed barriers Patient level factors: 1. lack of time, 2. feeling too ill/tried to participate, 3. needing to tend to family members 4. indirect costs to access services 5. socio-cultural factors such as needing	Participants' expressed barriers Patient level factors: 1. raising awareness about both the disease and the screening services 2. higher uptake (83%) in women who attended an educational talk prior to being offered the breast

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	Barriers (participants' and providers')	Enablers (participants' and providers')
		cervical cancer		husband's approval 6. negative perceptions about preventive care 7. religion and educational barriers 8. embarrassment and modesty Facility level factor: 1. For breast cancer no data were reported on numbers trained by national initiatives or other projects 2. lack of resources such as acetic acid and stock-outs of basic medical supplies 3. facilities offering screening in busy family	cancer screening service compared with those who did not. 3. combining cervical and breast cancer

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	Barriers (participants' and providers')	Enablers (participants' and providers')
				planning rooms. 4. health facilities did not conduct the cancer screening daily Health System Level Factors 1. Inadequate funding 2. high staff turnover in government facilities 3. lack of awareness and clarity about national policies and guidelines	
Breast cancer					
Babu et al 2013	Number of studies: 16 Study Designs: Case studies, nested case control study, studies	Sample Size: Not reported. Gender: Women Age: range 16-79 years Type of NCDs:	Not explicitly mentioned	Participants' expressed barriers Lack of awareness about screening, costs, fear and stigma associated with the disease	

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	Barriers (participants' and providers')	Enablers (participants' and providers')
	based on secondary data analysis and cross-sectional study. Countries: South India (majority conducted in Kerala, followed by Karnataka, Tamil Nadu and Andhra Pradesh Setting: Urban and rural settings	Breast cancer			

Five primary studies were identified and included that reported on barriers and enablers for screening uptake for diabetes, hypertension and oral cancer.(19-23) The following section provides a summary of the findings and the emerging themes.

Diabetes

A study by Tripathy (2020) conducted in six districts across three states in India reported on some of the barriers related to screening for diabetes.(23) Screening was done by blood glucose testing using strip method. Most of the participants in the study reported overcrowding, long waiting times and inadequate care as the major barriers to receiving preventive services, including screening at public health facilities.(23)

Hypertension

Demaio et al (2013) conducted a study in Mongolia that explored barriers to blood pressure screening.(19) Almost half of the study participants rated a lack of self-perceived importance as the main barrier for screening uptake (47.8%). In addition, a lack of awareness of the need to be screened was reported as another major barrier. A lack of time was cited by 17.3% of the study respondents, while a few (5.4%) reported a lack of awareness of screening services and access. The study authors concluded that targeted campaigns, incentives or opportunistic screening may prove to be more effective than the existing passive screening programs in Mongolia.(19)

Oral cancer

A study by Kaur et al (2020) was conducted in Haryana, India to identify the barriers and facilitators for opportunistic oral cancer screening in a public health facility.(20) In-depth interviews were conducted with the dental practitioners and faculty in charge of a dental outpatient department. Some of the barriers reported included the lack of better linkage with referral facility, and shortage of human resources including support staff. The respondents stated that opportunistic screening should be integrated within the existing system; however, since public health facilities are already over-burdened, there is a need for additional staff. Facilities for biopsy need to be developed. Training of dental practitioners is important to ensure quality. A well-developed system for follow-up and linkage with referral sites is required.

Cancers, diabetes and hypertension

In a qualitative study conducted in Nepal, barriers to screening for several NCDs, including cancers, diabetes and hypertension were explored from HCPs perspective. Health care providers reported perceived the following barriers to screening uptake: no government sponsored screening programs for NCDs; and patients do not come to visit HCPs in the early phases of the disease and mostly rely on self-diagnosis and self-medication.(21)

In another study in Malawi, providers' perspectives were sought to identify the barriers and facilitators related to screening uptake for the NCDs of interest.(22) Almost all the respondents (91%) cited inadequate financial capacity, 78% reported inadequate human resources, 65% reported inadequate technical capacity, and 56% stated that the community lacked knowledge about NCDs. Lack of resources including

inadequate staff, equipment, and supplies was the other major barrier. Lack of transportation for community outreach was reported as a major access barrier.(22)

The study also reported on facilitators for screening uptake.(22) Community-based clinics, enhanced NCD screening efforts, capacity-building, and better coordination and integration of services among departments were emphasised as opportunities to improve NCD screening uptake services. Effective integration of the NCD program with long-established existing health programs such as those for tuberculosis, HIV, and nutrition was suggested as an efficient way to facilitate greater community outreach and active NCD screening.(22)

Table 3 Characteristics of included primary studies on barriers and enablers to oral cancer, diabetes and hypertension 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	Barriers (participants' and providers')	Enablers (participants' and providers')
Demaio et al 2013(19)	Study Design: Cross sectional Study (KAP) Country: Mongolia Setting: Both Urban and Rural setting	Sample Size: 3450 Gender: Both men and women Age: Median age was 33 years. Range was between 15 to 64. Type of NCD: Hypertension	None	1. Lack of awareness of the need to be screened was reported by almost three in ten responses (95%CI: 27.9-30.9). 2.Time constraints	Targeted campaigns, incentives or opportunistic screening more effective than current passive screening programs
Kaur et al 2020 (20)	Study Design: Cross Sectional study was conducted followed by In-depth-interviews Country: India Setting: Most patients belonged to rural	Sample Size: 3450 Gender: Both men and women Age: varied between less than 18 to above 60.	Dental Surgeon screening the Patients in the OPD	Patient's Perspective 1. Need for better linkage with referral facility, including the transfer of patients and communication of the diagnosis. 2. The perceived shortage of human resources Barriers:	Providers' perspective: Training for all dental practitioners to detect cancer and other lesions.

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	Barriers (participants' and providers')	Enablers (participants' and providers')
	setting and explicit mention to urban setting is not made.	Type of NCD: Oral Cancer		Provider's Perspectives 1. Need for better linkages for referral for diagnosis and treatment. 2. Understaffing	
Khanal et al 2017(21)	Study Design: Qualitative Study Country: Nepal Setting: Urban area	Sample Size: 9 Gender: Both men and women Age: Ranged between 26 to 62. Type of NCDs: General NCD care	General NCD Care	Providers' perspective: 1. No government sponsored screening programs for the diagnosis of NCDs. 2. Patients do not come to visit healthcare professionals in the early phases of the disease and mostly relied on self-diagnosis and self-medication. 3. Patients do not usually come for follow-up visits because visiting a doctor is unaffordable.	Not captured
Lupafya et al 2016(22)	Study Design: Quantitative and Qualitative design Country: Malawi	Sample Size: 9 Gender: Both men and women	Blood Test and BMI	Providers' perspective: 1. Almost all (91%) cited inadequate financial capacity, 78% affirmed inadequate human resources, 65% reported inadequate technical	Community-based clinics, enhanced NCD screening efforts, capacity-building, and better coordination and integration of services among

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	Barriers (participants' and providers')	Enablers (participants' and providers')
	Setting: Not explicitly stated	Age: Ranged between 26 to 62. Type of NCDs: General NCD care		capacity, 56% agreed that the community lacked knowledge about NCDs, and 52% viewed data management as weak. 2. Lack of resources; inadequate staff, equipment, and supplies; and erratic drug supply. 3. Lack of transportation for community outreach was a major theme.	departments. Effective integration of the NCD program with long-established existing health programs such as those for tuberculosis, HIV, and nutrition to facilitate greater community outreach and active NCD screening.
Tripathy et al 2020(23)	Study Design: Mixed Methods Approach Country: India Setting: Both urban and rural setting	Sample Size: 42 interviews were conducted. Gender: Both men and women Age: Ranged between 26 to 62. Type of NCD: Diabetes	Blood test	Perceived Barriers Providers 1. Lack specialised training in diabetes. 2. Patient Overload 3. Poor follow-up of patients 4. Lack of training Patients 4. Repeated travel back to the PHC 5. Lack of lab investigations & medicines at PHC	Not reported

4. Contextualisation of evidence

Some of the barriers that were identified in the review, particularly structural or health systems factors are already being addressed in the Indian context through implementation of relevant strategies. Most of the identified barriers were specifically related to logistics and long waiting time.

Personal factors

Embarrassment: The issue of males performing the screening procedure is not relevant in Indian settings. In India, female trained ASHAs and ANMs workers have been performing screening in many states, mainly VIA and CBE.(Page 74 – Module) Further, screening is conducted at sites in a separate room for women where privacy is assured. With adequate training, ANMs may be encouraged to conduct cervical cancer screening by VIA. Similarly screening for breast cancer is performed by a trained health worker, generally a staff nurse or an ANM, who received training for conducting Clinical Breast Examination (CBE). (Page 76 – Module)

Knowledge and awareness: HIV-positive women with low knowledge of cervical cancer and cervical cancer screening were less likely to undergo screening, as identified in the review. However, the programme is designed to increase community awareness for all, in urban areas, with universal screening for all females aged 30 years and above. Screening for oral cancer is conducted by a trained health worker such as ANM, through Oral Visual Examination (OVE). (Page 80 of Module). Clinical breast examinations by trained health workers also provide an opportunity to talk with the woman about her health and allow appropriate lifestyle counselling. In addition, having regular breast examinations help women to learn about their body. (Page 76 – Module)

Structural/Health systems factors

Logistics: Lack of transportation and long distance to hospital/screening centres is being addressed through bringing screening closer to community. The program is designed to ensure that no person needs to travel more than half an hour to reach the site selected for screening.(Page 20 Training Module) For example, in some states like Andhra Pradesh, screening for hypertension and diabetes in community is done through Mobile Medical Units on a regular basis (Page 7, 12th CRM). Outreach Camps are organised for opportunistic screening at all levels in the health care delivery system from sub-centre and above for early detection of diabetes, hypertension and common cancers.

Difficulty in navigating health care facilities and services - Refer to CPHC and Population based screening. Also, we need to refer to CRM.

Long waiting time: Long waiting times in clinics or hospitals, particularly public health facilities that provide screening services was seen as a major barrier in availing screening services. With screening being undertaken at the UPHC level, and in a planned schedule, the issue of long waiting hours is addressed. Further, having a fixed number of people to be screened also addresses the issue of long waiting times.

Screening costs: Screening cost, particularly in regions where poverty is high and there are many other priority health issues, out-of-pocket payment for non-emergency health services such as cervical and breast cancer screening services was reported to be a major barrier to utilisation faced by most women. The screening services are provided free of cost now.

Attitudes of health workers: Negative attitudes of health care providers (HCPs) towards women, particularly towards HIV-positive women was reported as another important barrier towards utilisation of cancer screening service. The screening programme is designed to increase community awareness for all, in urban areas, with universal screening for all females aged 30 years and above.

5. Gaps in evidence

The burden of NCDs, particularly diabetes and hypertension is higher in LMICs; however, there is a lack of evidence on the barriers and enablers to facilitate screening uptake.

6. Recommendations for future research

The limited evidence from LMICs on NCDs such as diabetes, hypertension and oral cancer showed that further research including qualitative studies is needed to bridge the knowledge gaps to explore the barriers and facilitators to help improve screening uptake.

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7. Appendix

Appendix 1: Search strategies for systematic reviews (all NCDs of interest)

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	1,669,856

	"early diagnosis of cancer"[tiab] OR “visual oral examination”[tiab] OR “clinical oral examination”[tiab] OR “visual acetic acid”[tiab] 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	barrier*[tiab] OR facilitat*[tiab] OR enablers[tiab] OR obstacle*[tiab] OR challenge*[tiab]	1,488,578
10	6 AND 7 AND 8 AND 9 Filters: 10 years; English	438

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 “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)	954,848
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	(barrier* OR facilitat* OR enablers OR obstacle* OR challenge*):ti OR (barrier* OR facilitat* OR enablers OR obstacle* OR challenge*):ab	1,838,363
10	6 AND 7 AND 8 AND 9 AND [english]/lim AND [humans]/lim AND [embase]/lim AND [2010-2020]/py	473

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 (barriers OR facilitators OR enablers OR challenges) Filters: Document type (overviews of systematic reviews, systematic reviews of effects, systematic reviews addressing other questions); Date range (10 years)	64
2	Selected for potential FT examination	3

Appendix 2: Search strategies for primary studies on oral cancer, diabetes and hypertension

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] OR “oral cancers”[tiab] OR “cancer of mouth”[tiab] OR “mouth cancer”[tiab])	73,882
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]))	535,156

	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 "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	1,747,280
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	1,363,365

	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]	
10	afghanistan[tw] OR albania[tw] OR algeria[tw] OR american samoa[tw] OR angola[tw] OR antigua[tw] OR barbuda[tw] OR	2,040,449

	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 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	barrier*[tiab] OR facilitat*[tiab] OR enablers[tiab] OR obstacle*[tiab] OR challenge*[tiab]	1,491,482
13	4 AND 5 AND 8 AND 11 AND 12 Filters: 10 years; English	183

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 cancer” OR "early diagnosis of cancer" OR “visual oral examination” OR “clinical oral examination”):ab)	731,657
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	849,151

	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 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	2,006,913
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	97,473

	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 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	858,634

	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 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	(barrier* OR facilitat* OR enablers OR obstacle* OR challenge*):ti OR (barrier* OR facilitat* OR enablers OR obstacle* OR challenge*):ab	1,842,787
13	4 AND 5 AND 8 AND 11 AND 12 AND [english]/lim AND [humans]/lim AND [embase]/lim AND [2010-2020]/py	90

Appendix 3: PRISMA Study Selection Flow Charts

Figure 1 PRISMA study selection flow chart for systematic reviews on cervical and breast cancer screening

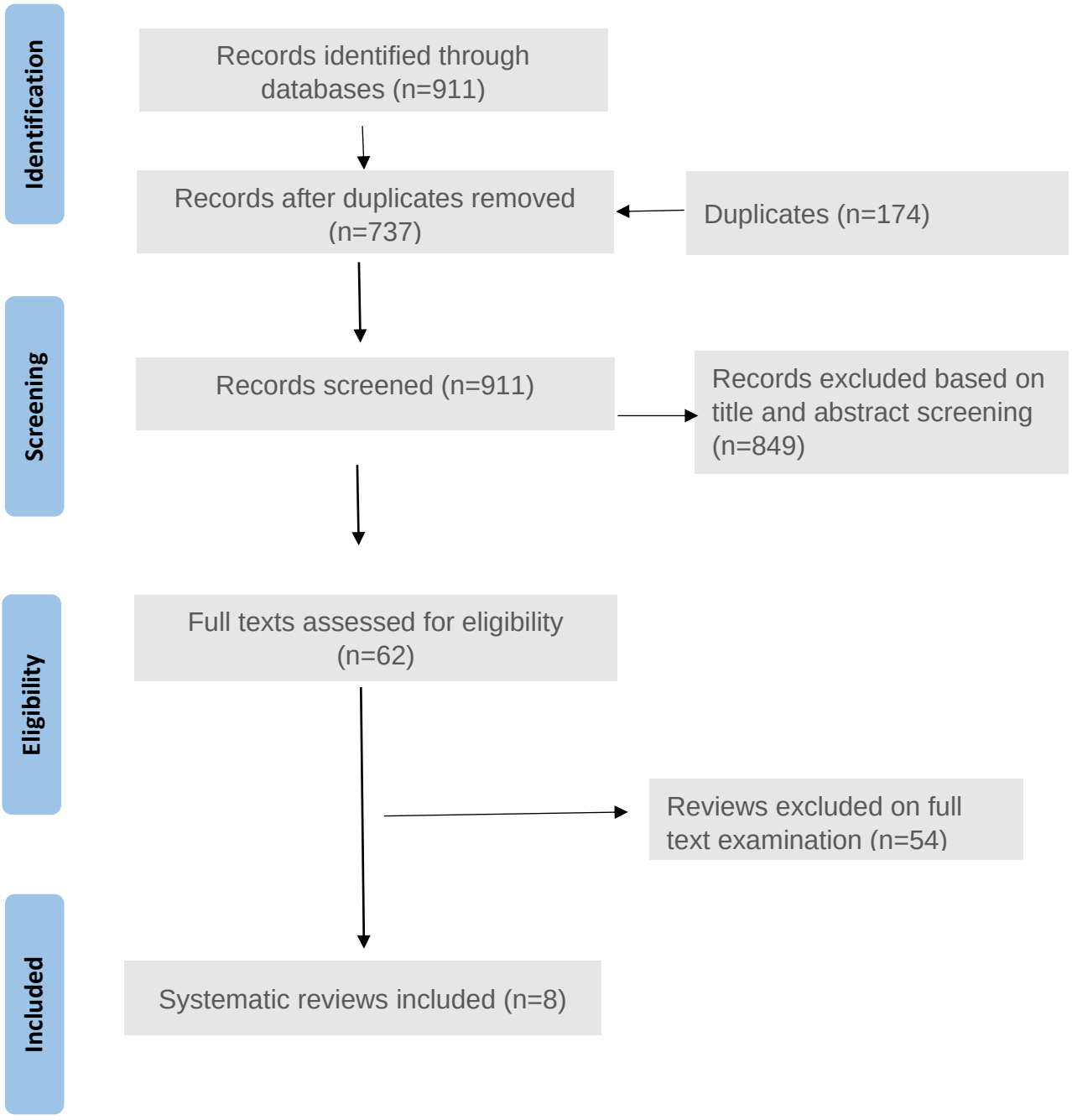
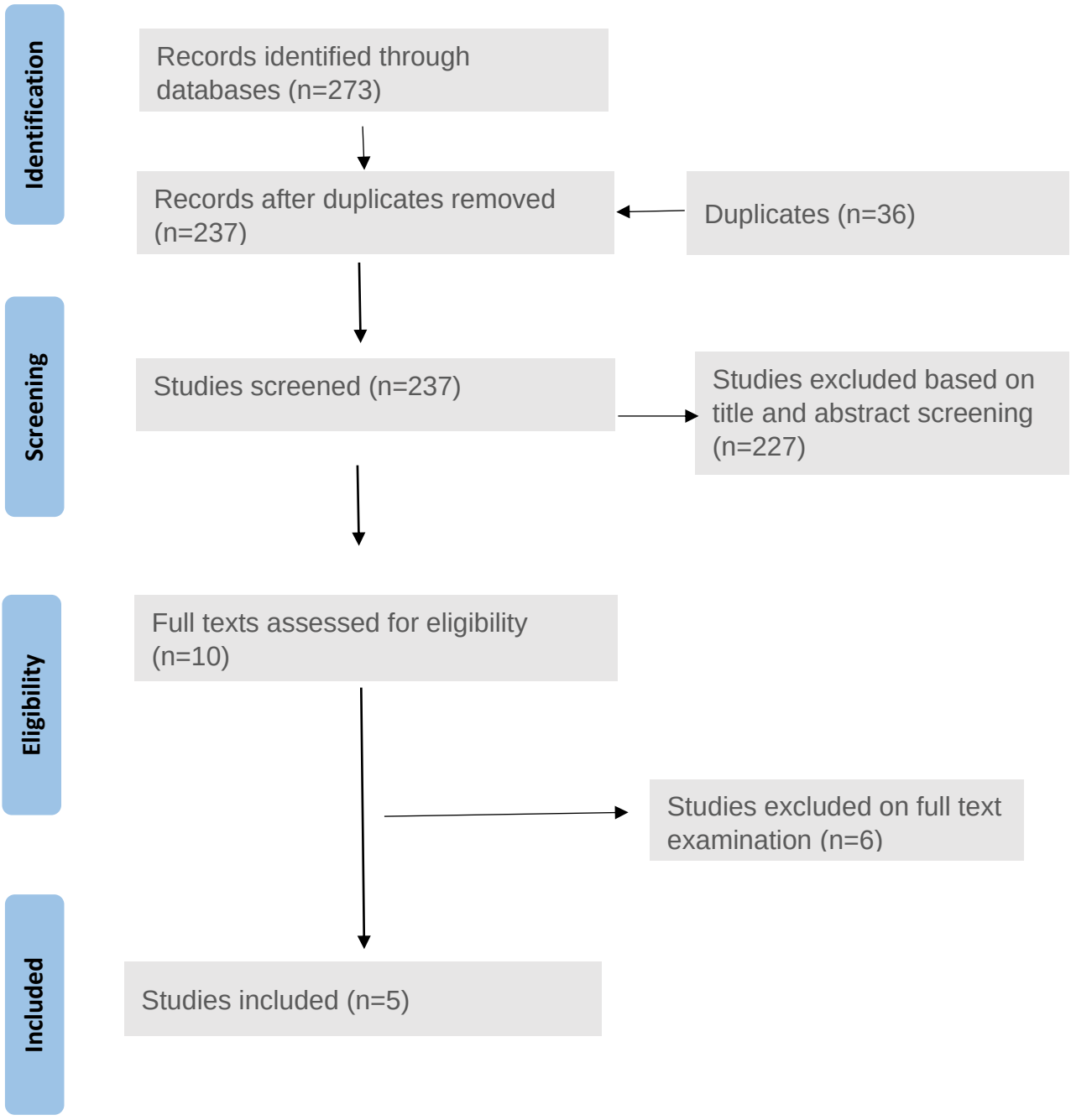


Figure 2 PRISMA study selection flow chart for studies on oral cancer, diabetes and hypertension screening



Appendix 4: List of excluded systematic reviews with reasons for exclusion

Systematic reviews that included studies conducted in HICs or UMICs

1. Aggarwal A, urangi A, Smith W. Disparities in breast and cervical cancer screening in women with mental illness: A systematic literature review. American Journal of Preventive Medicine. 2013;44(4):392-8.
2. Aidalina M, Syed Mohamed ASJ. The uptake of Mammogram screening in Malaysia and its associated factors: A systematic review. Med J Malaysia.73(4):202-11.
3. Andreeva VA, Pokhrel P. Breast cancer screening utilization among Eastern European immigrant women worldwide: a systematic literature review and a focus on psychosocial barriers. Psychooncology.22(12):2664-75.
4. Azami-Aghdash S, Ghojazadeh M, Sheyklo SG, Daemi A, Kolahdouzan K, Mohseni M, et al. Breast Cancer Screening Barriers from the Womans Perspective: a Meta-synthesis. Asian Pac J Cancer Prev. 2015;16(8):3463-71.
5. Baron RC, Melillo S, Rimer BK, Coates RJ, Kerner J, Habarta N, et al. Intervention to increase recommendation and delivery of screening for breast, cervical, and colorectal cancers by healthcare providers a systematic review of provider reminders. Am J Prev Med.38(1):110-7.
6. Biddell CB, O'Leary MC, Wheeler SB, Spees LP. Variation in Cervical Cancer Screening Preferences among Medically Underserved Individuals in the United States: A Systematic Review. Cancer Epidemiol Biomarkers Prev.29(8):1535-48.
7. Buckley BS, Harreiter J, Damm P, Corcoy R, Chico A, Simmons D, et al. Gestational diabetes mellitus in Europe: prevalence, current screening practice and barriers to screening. A review. Diabet Med.29(7):844-54.
8. Bukowska-Durawa A, Luszczynska A. Cervical cancer screening and psychosocial barriers perceived by patients. A systematic review. Contemp Oncol (Pozn). 2014;18(3):153-9.
9. Chan DNS, So WKW. A Systematic Review of the Factors Influencing Ethnic Minority Women's Cervical Cancer Screening Behavior: From Intrapersonal to Policy Level. Cancer Nurs. 2017;40(6):E1-e30.
10. Chorley AJ, Marlow LA, Forster AS, Haddrell JB, Waller J. Experiences of cervical screening and barriers to participation in the context of an organised programme: a systematic review and thematic synthesis. Psychooncology.26(2):161-72.
11. Connolly D, Hughes X, Berner A. Barriers and facilitators to cervical cancer screening among transgender men and non-binary people with a cervix: A systematic narrative review. Prev Med.135:106071.
12. Copeland VC, Kim YJ, Eack SM. Effectiveness of Interventions for Breast Cancer Screening in African American Women: A Meta-Analysis. Health services research.

2018;53:3170-88.
13. Da Costa Vieira RA, Formenton A, Bertolini SR. Breast cancer screening in Brazil. Barriers related to the health system. Revista da Associacao Medica Brasileira. 2017;63(5):466-74.
14. De Cuevas RMA, Saini P, Roberts D, Beaver K, Ch, rashekar M, et al. A systematic review of barriers and enablers to South Asian women's attendance for asymptomatic screening of breast and cervical cancers in emigrant countries. BMJ Open. 2018;8(7).
15. de Waard AM, Wändell PE, Holzmann MJ, Korevaar JC, Holl, er M, et al. Barriers and facilitators to participation in a health check for cardiometabolic diseases in primary care: A systematic review. Eur J Prev Cardiol.25(12):1326-40.
16. Dennison RA, Fox RA, Ward RJ, Griffin SJ, Usher-Smith JA. Women's views on screening for Type 2 diabetes after gestational diabetes: a systematic review, qualitative synthesis and recommendations for increasing uptake. Diabet Med.37(1):29-43.
17. Dhippayom T, Chaiyakunapruk N, Krass I. How diabetes risk assessment tools are implemented in practice: a systematic review. Diabetes Res Clin Pract.104(3):329-42.
18. Fang CY, Ragin CC. Addressing disparities in cancer screening among U.S. immigrants: Progress and opportunities. Cancer Prevention Research. 2020;13(3):253-9.
19. Ferdous M, Lee S, Goopy S, Yang H, Rumana N, Abedin T, et al. Barriers to cervical cancer screening faced by immigrant women in Canada: A systematic scoping review 11 Medical and Health Sciences 1117 Public Health and Health Services. BMC Women's Health. 2018;18(1).
20. Fern, ez ME, Savas LS, Lipizzi E, Smith JS, Vernon SW. Cervical cancer control for Hispanic women in Texas: Strategies from research and practice. Gynecologic Oncology. 2014;132:S26-S32.
21. Grimley CE, Kato PM, Grunfeld EA. Health and health belief factors associated with screening and help-seeking behaviours for breast cancer: A systematic review and meta-analysis of the European evidence. Br J Health Psychol.25(1):107-28.
22. Hendry M, Pasterfield D, Lewis R, Clements A, Damery S, Neal RD, et al. Are women ready for the new cervical screening protocol in England? A systematic review and qualitative synthesis of views about human papillomavirus testing. Br J Cancer.107(2):243-54.
23. Hurtado-de-Mendoza A, Song M, Kigen O, Jennings Y, Nwabukwu I, Sheppard VB. Addressing cancer control needs of African-born immigrants in the US: a systematic literature review. Prev Med.67:89-99.
24. Jerome-D'Emilia B. A systematic review of barriers and facilitators to mammography in Hispanic women. J Transcult Nurs.26(1):73-82.
25. Jerome-D'Emilia B, Gachupin FC, Suplee PD. A Systematic Review of Barriers and Facilitators to Mammography in American Indian/Alaska Native Women. J Transcult Nurs.30(2):173-86.
26. Jones CE, Maben J, Jack RH, Davies EA, Forbes LJ, Lucas G, et al. A systematic review of barriers to early presentation and diagnosis with breast cancer among black women. BMJ Open.4(2):e004076.
27. Kim K, Han HR. Potential links between health literacy and cervical cancer screening behaviors: a systematic review. Psychooncology. 2016;25(2):122-30.
28. Kizior A, Kizior P, Spisz J. Barriers to participation in breast and cervical cancer screening (analysis of international research). Asia-Pacific Journal of Clinical Oncology. 2014;10:178.
29. Kizior AM, Kizior PJ, Spisz JS. Cervical cancer prevention in Eastern Europe-barriers

and challenges. Asia-Pacific Journal of Clinical Oncology. 2014;10:237.
30. Majid U, asamy S, Farrah K, Vanstone M. Women's preferences and experiences of cervical cancer screening in rural and remote areas: a systematic review and qualitative meta-synthesis. Rural Remote Health.19(4):5190.
31. Marques P, Nunes M, Antunes MDL, Heleno B, Dias S. Factors associated with cervical cancer screening participation among migrant women in Europe: A scoping review. International Journal for Equity in Health. 2020;19(1).
32. Mema SC, Yang H, Vaska M, Elnitsky S, Jiang Z. Integrated cancer screening performance indicators: A systematic review. PLoS ONE. 2016;11(8).
33. Nagendiram A, Bougher H, Banks J, Hall L, Heal C. Australian women's self-perceived barriers to participation in cervical cancer screening: A systematic review. Health Promot J Austr.31(3):343-53.
34. Naz MSG, Simbar M, Fakari FR, Ghasemi V. Effects of model-based interventions on breast cancer screening behavior of women: a systematic review. Asian Pacific Journal of Cancer Prevention: APJCP. 2018;19(8):2031.
35. Nielsen KK, Kapur A, Damm P, de Courten M, Bygbjerg IC. From screening to postpartum follow-up - the determinants and barriers for gestational diabetes mellitus (GDM) services, a systematic review. BMC Pregnancy Childbirth. 2014;14:41.
36. Oh KM, Taylor KL, Jacobsen KH. Breast Cancer Screening Among Korean Americans: A Systematic Review. J Community Health.42(2):324-32.
37. Orji CC, Kanu C, Adelodun AI, Brown CM. Factors that Influence Mammography Use for Breast Cancer Screening among African American Women. Journal of the National Medical Association. 2020.
38. Plourde N, Brown HK, Vigod S, Cobigo V. Contextual factors associated with uptake of breast and cervical cancer screening: A systematic review of the literature. Women Health.56(8):906-25.
39. Priaulx J, Turnbull E, Heijnsdijk E, Csanádi M, Senore C, de Koning HJ, et al. The influence of health systems on breast, cervical and colorectal cancer screening: an overview of systematic reviews using health systems and implementation research frameworks. J Health Serv Res Policy. 2020;25(1):49-58.
40. Rainey L, Jervaeus A, Van Der Waal D, Wengström Y, Broeders M. Women's perceptions on personalised risk-based breast cancer screening and primary prevention: A systematic review. European Journal of Cancer. 2016;57:S25.
41. Smith D, Thomson K, Bambra C, Todd A. The breast cancer paradox: A systematic review of the association between area-level deprivation and breast cancer screening uptake in Europe. Cancer Epidemiol.60:77-85.
42. Vieira R, Formenton A, Bertolini SR. Breast cancer screening in Brazil. Barriers related to the health system. Rev Assoc Med Bras (1992). 2016;63(5):466-74.
43. Wu Z, Liu Y, Li X, Song B, Ni C, Lin F. Factors associated with breast cancer screening participation among women in mainland China: a systematic review. BMJ open. 2019;9(8):e028705.
44. Zha N, Alabousi M, Patel BK, Patlas MN. Beyond Universal Health Care: Barriers to Breast Cancer Screening Participation in Canada. J Am Coll Radiol.16(4):570-9.

Other reasons for exclusion

1. Al-Foheidi M, Al-Mansour MM, Ibrahim EM. Breast cancer screening: Review of benefits and harms, and recommendations for developing and low-income countries.

Medical Oncology. 2013;30(2). - not a SR; literature review.
2. Bowser D, Marqusee H, El Koussa M, Atun R. Health system barriers and enablers to early access to breast cancer screening, detection, and diagnosis: a global analysis applied to the MENA region. Public Health. 2017;152:58-74. - Except one study conducted in Egypt (a LMIC), 54/55 studies were conducted in HICs. No barriers or facilitators were explicitly reported for this study.
3. Dessalegn Mekonnen B. Cervical Cancer Screening Uptake and Associated Factors among HIV-Positive Women in Ethiopia: A Systematic Review and Meta-Analysis. Advances in Preventive Medicine. 2020;2020. - not related to component 2. For component 1, the study designs were not relevant, as all the seven included studies were cross-sectional
4. Khatib R, Nieuwlaat R, Schwalm JD, Khan M, Haynes RB, Connolly S, et al. Barriers to hypertension screening, treatment and control as reported by patients and healthcare providers. Circulation: Cardiovascular Quality and Outcomes. 2013;6(3). - Conference abstract - no FT available. Also, lacks details on countries/settings
5. Paduch A, Kuske S, Schiereck T, Droste S, Loerbroks A, Sørensen M, et al. Psychosocial barriers to healthcare use among individuals with diabetes mellitus: A systematic review. Prim Care Diabetes.11(6):495-514. - wrong population- diabetic retinopathy
6. Rahman R, Clark MD, Collins Z, Traore F, Dioukhane EM, Thiam H, et al. Cervical cancer screening decentralized policy adaptation: an African rural-context-specific systematic literature review. Glob Health Action. 2019;12(1):1587894. - in rural context- wrong population
7. Simbar M, Ghazanfarpour M, Abdolahian S. Effects of training based on the health belief model on Iranian women's performance about cervical screening: A systematic review and meta-analysis. Journal of Education and Health Promotion. 2020;9. - Not LMIC
8. Speight PM, Epstein J, Kujan O, Lingen MW, Nagao T, Ranganathan K, et al. Screening for oral cancer-a perspective from the Global Oral Cancer Forum. Oral Surg Oral Med Oral Pathol Oral Radiol.123(6):680-7. - wrong study design
9. Guillaume D, Ch, ler R, Igbinoba S. Barriers to Cervical Cancer Screening Among Women Living With HIV in Low- and Middle-Income Countries: A Systematic Review. J Assoc Nurses AIDS Care. 2020;31(5):497-516. - a more comprehensive SR in the same target population by Kasraeian et al is available. More number of studies, and all the studies in this SR are included in the SR by Kasraeian
10. Paudyal P, Flohr FD, Llewellyn CD. A systematic review of patient acceptance of screening for oral cancer outside of dental care settings. Oral Oncol. 2014;50(10):956-62. - the majority of the studies (n = 7) were conducted in the UK, two in the USA, one in Canada and two in India. ut the two studies do not relate to screening uptake or utilisation The outcome was about screening utilisation. On further examination of the two primary studies, they we related to the diagnostic accuracy of various tests in improving screening.

Appendix 5: List of excluded primary studies with reasons for exclusion (diabetes hypertension and oral cancer)

1. Ahmed NHM, Naidoo S. Oral Cancer Knowledge, Attitudes, and Practices among Dentists in Khartoum State, Sudan. J Cancer Educ. 2019;34(2):291-6. - this study was about knowledge and attitudes of dentists on oral cancer. There was a lack of information on screening, except a brief mention
2. Chukwuma A, Gong E, Latypova M, Fraser-Hurt N. Challenges and opportunities in the continuity of care for hypertension: a mixed-methods study embedded in a primary health care intervention in Tajikistan. BMC Health Serv Res. 2019;19(1):925. - rural health centres. Mixed methods study - survey and FGDs
3. Dsouza JP, Van Den Broucke S, Pattanshetty S, Dhoore W. Exploring the Barriers to Cervical Cancer Screening through the Lens of Implementers and Beneficiaries of the National Screening Program: A Multi-Contextual Study. Asian Pac J Cancer Prev. 2020;21(8):2209-15. - more focus on rural setting, wiith very limited information for urban settings
4. Flor LS, Wilson S, Bhatt P, Bryant M, Burnett A, Camarda JN, et al. Community-based interventions for detection and management of diabetes and hypertension in underserved communities: a mixed-methods evaluation in Brazil, India, South Africa and the USA. BMJ Glob Health. 2020;5(6). - the studies from India and South Africa appear to have been conducted in rural settings
5. Kumar S, Shewade HD, Vasudevan K, Durairaju K, Santhi VS, Sunderamurthy B, et al. Effect of mobile reminders on screening yield during opportunistic screening for type 2 diabetes mellitus in a primary health care setting: A randomized trial. Prev Med Rep. 2015;2:640-4. - this is about screening yield, which refers to the number of cases detected. Lacks information on screening uptake
6. Tan J, Xu H, Fan Q, Neely O, Doma R, Gundi R, et al. Hypertension Care Coordination and Feasibility of Involving Female Community Health Volunteers in Hypertension Management in Kavre District, Nepal: A Qualitative Study. Glob Heart. 2020;15(1):73. - Study conducted in the rural areas of Kavre district, Nepal.