Health Technology Assessment of Mammography Screening in the West Bank

Protocol for evidence synthesis and budget impact analysis

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Summary

The Palestinian National Institute of Public Health commissioned this study, to evaluate the use of mammography screening for detection of breast cancer in women in the West Bank.

A health technology assessment (HTA) will be undertaken to evaluate the clinical and economic impact of mammography screening in the West Bank. The evaluation methods include an adaptation or adoption of an existing evidence synthesis to inform on the clinical effectiveness and safety of breast cancer screening. We will conduct a systematic search in the major international databases for recent high quality evidence syntheses as, systematic reviews and guidelines, and transfer these to the context of the West Bank. Secondly, a situational analysis that includes a literature review, additional desktop searches, and engagements with stakeholders will be organized. Lastly, an economic analysis will be conducted to evaluate the financial impact of breast cancer screening in the West Bank. Wide consultations will be organized to engage local stakeholders and seek validation through the incorporation representative views.

The final draft of the HTA report will be shared with stakeholders and circulated for comments, after which the core team will finalize the report. The report will be disseminated with the aim to aid evidence-based decision-making in Palestine.

Title:
Health Technology Assessment of Mammography Screening in the West Bank

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Protocol for an evidence synthesis and budget impact analysis

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Commissioned by:
Funded by NORAD, commissioned by Palestinian National Institute of Public Health

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Start date:
09.01.2020
End date:
30.06.2020

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Objectives

To undertake an assessment of the clinical and economic impact of mammography screening vs. no mammography screening for the detection of breast cancer among women in the West Bank.

Background

Breast cancer is the most common cancer in both the West Bank and Gaza Strip, and accounts for 22% of cancer deaths among women (1). Estimates indicate that cancer incidence in Palestine will increase due to increased longevity and improved detection and screening efforts. Specifically, for breast cancer, projections indicate that the incidence and mortality will double by the year 2040 (1).

The increased cancer incidence will have notable consequences for the already challenged financial resources and infrastructural capacities in the Palestinian health system. The national Palestinian health budget spends 80% of its budget on healthcare cost related to non-communicable diseases (NCD) and costs related to cancer take up a significant amount of this budget (2). Early detection and treatment is key to managing the increasing burden of breast cancer.

Description of the problem or issue

The Ministry of Health (MoH) offers free mammography screening in the West Bank since 2008-2009 and in the Gaza Strip since 2010. Current guidelines recommend yearly screening for women between 40-50 years and every two years for women 50-60 years (3). In 2014, a retrospective cohort study evaluated the performance of the national breast cancer screening program and it highlighted multiple challenges, including shortages or wrong-sized films; missing (harmonized) guidelines on screening or referral of suspected cases; missing (non-digital) registries; infrastructure problems in clinics; inadequate capacities among technicians and physicians (4). The lack of knowledge, social stigma, and fear further delay women to seek the right care (5). These structural and cultural challenges might lower the number of women participating in screening, resulting in poorer health outcomes and diagnosis of cancer at a late stage (6, 7). Hence, there is a need for evidence to inform resources allocation decisions that promotes the effective and efficient detection and management of breast cancer in Palestine.

Why is it important to do this assessment?

In Palestine, notable changes have been made to the breast cancer-screening program in the last few years, including the relocation of equipment, improvement to infrastructure, and the development of a national mammography e-registry. The MoH plans to evaluate the national breast cancer screening program in 2020 (3), the results of this assessment can be used to inform policy options on breast cancer screening.

Aims

The aim of this HTA is to assess the clinical and economic impact of mammography screening compared to no mammography screening for the detection of breast cancer among women over the age of 40 years in the West Bank.

Methods

Evaluation methods will include: 1) a review of the international evidence on breast cancer screening, 2) a situational analysis of the Palestinian context including reviews of official reports and guidelines, stakeholder engagement and interviews with experts, 3) a budget impact analysis to show the financial implications of breast cancer screening in Palestine.

The problem, condition or issue

This study will review the evidence on breast cancer screening in order to inform Palestinian policy and practice on screening modalities, particularly related to the appropriate age for mammography. The study seeks to answer the primary research question:

- Should organized mammography vs no mammography screening be used for early detection of breast cancer in women aged 40 to 75 years in the West Bank?

Secondary research questions:

- What is the recommend frequency of screening to be used for early detection of breast cancer in women aged 40 to 75 years in the West Bank?
- What is the associated financial cost if screening is to be used for early detection of breast cancer in women aged 40 to 75 years in the West Bank?

It is important to note, that the wording and scope of this research question has been discussed on several occasions after its first internal publication. At first, during a consensus meeting between PNIPH and NIPH, the research question proposed was to merely cover the use of mammography in screening for early detection in Palestine. The question was no focused on the West Bank, neither did it include the secondary research questions. In an internal inception report, the research question was elaborated upon and consisted out of two primary question with four sub-questions, one secondary question, and two further questions (see Appendix 4).

However, after discussions within the core team, it was decided to answer the research question as discussed in the first consensus meeting with the inclusion of two secondary research questions on frequency recommendations and the financial impact of screening. Secondly, the research questions will focus on the West Bank instead of Palestine in general. The reason was that now only one policy-context needed to be considered which was preferred given that this is the first time an HTA pilot is conducted in Palestine.

Methods for the literature review

A systematic search of the international literature will be undertaken to identify systematic reviews, HTAs and guidelines on breast cancer screening.

Inclusion criteria

Study design (in order of priority):

1. Health technology assessments
2. Systematic reviews

3.Guidelines
4.Randomized controlled trials

Population:	Asymptomatic women between the ages of 40 and 75 years
Intervention:	Mammography screening
Comparison:	No mammography screening
Outcome:	Morbidity, mortality, quality of life

Only evidence synthesis will be included if published in English language and between 2016 and 2019.

Search strategy

We will search for evidence syntheses including systematic reviews, HTAs and guidelines summarizing the effects of breast cancer screening in the international literature. The search strategy (Appendix 1) is adopted from a similar review of breast cancer screening undertaken in Moldova by the NIPH in collaboration with National Public Health Agency of Moldova. This strategy was developed by an Information Specialist (Librarian) at NIPH for the following databases: Epistemonikos, PubMed and the Cochrane Database of Systematic Reviews. An additional search was undertaken for international guidelines (and systematic reviews therein) in various electronic databases and websites. The initial search in the Moldova review was undertaken between the 1st and the 15th of September 2019 for systematic reviews and between the 15th and the 30th of January 2020 for international guidelines. We updated this search in September 2020 for the Palestine review.

Study selection

Articles will first be screened for inclusion based on titles and abstracts by two reviewers. Included full-text articles and guidelines will be further independently reviewed by two reviewers for final inclusion and data extraction. Any disagreements on eligibility between reviewers will be resolved by discussion or the final judgement of a third reviewer. Relevant systematic reviews that match the research question will be assessed for quality. The most recent high quality systematic reviews and guidelines that more accurately correspond to our PICO will be selected for extraction.

The selected study will be assessed for relevance, reliability and transferability with guidance from the European Network for Health Technology Assessment (EUnetHTA) Adaptation Toolkit (10) (Appendix 2).

Data collection

From the selected study, we primarily seek to extract information on clinical effectiveness and safety of breast cancer with a view to adapt the international evidence the Palestinian context. Guidance on evidence adaptation will be sought from EUnetHTA Adaptation Toolkit (10) and guiding questions for the extraction are adapted from the EUnetHTA HTA Core Model for Rapid Relative Effectiveness (11).

Furthermore, we will seek to extract information on the current use, description, technical characteristics and safety breast cancer screening modalities. These guiding extraction questions were also adapted from the EUnetHTA HTA Core Model for Rapid Relative Effectiveness (11) and are included in Appendix 3. Additional desktop research will be conducted if information on the included domains is not found in the included systematic review, HTA, or guideline (see situational analysis).

Situational analysis of the Palestinian context

A situational analysis will be undertaken to understand the trends, practices and issues related to breast cancer screening in Palestine. This will involve a desktop review of the literature including guidelines for breast cancer screening, as well as interviews with key experts and other stakeholders.

The desktop review included an analysis of official documentation from the Ministry of Health and other agencies. A limited search of the published literature on breast cancer in Palestine will be undertaken in PubMed, supplemented by manual searches in Google and Google Scholar. Potential data to be retrieved includes burden of disease; diagnosis and monitoring; responses to policy making; treatments; and healthcare related costs of breast cancer.

The engagements with experts and stakeholders, if possible including patients, will be structured by developing interview guides or discussion guides, but an iterative approach will be used to include any relevant topics brought up by the participants. The participants will be identified through the snowball method, a nonprobability sampling technique, where existing or known participants recruit future participants. Finally, an engagement with a representative group of stakeholders will be organized to validate the findings of HTA.

Budget impact analysis

We will undertake an economic analysis to assess the financial impact of breast cancer screening from the perspective of payer. Here, the payer will be identified the Ministry of Health in the West Bank who provides free mammography screening for women. A deterministic model will be created in Microsoft Excel to simulate a population-based breast cancer-screening program. The base case model will reproduce the breast cancer screening guideline to estimate the financial impact over a five-year period. A probabilistic sensitivity analysis will be undertaken to show the impact of the screening program over a lifetime time horizon, considering the natural history of breast cancer[1]. Data to populate the probabilistic model will be adapted from the literature and supplemented with local data where possible. The model will compare mammography vs. no mammography. We will use local cost data based on national expenditures or estimates of the costs of screening a woman for breast cancer in Palestine.

[1] This is optional and will depend on whether the team will have time and enough data to develop and populate the model

Timeframe

Study timeline

Activities		November				December				January			
		1	2	3	4	1	2	3	4	1	2	3	4
1	Drafting of inception report	■											
2	Stakeholder engagement on objectives and methods			■									
3	Desk review	■	■	■									
4	Interviews with experts				■								
5	Interviews with patients					■							
6	Search for systematic reviews and guidelines	■	■	■	■								
7	Assessment for relevance, reliability and transferability			■	■								
8	Retrieving evidence from systematic reviews and guidelines				■	■	■						
9	Budget impact analysis					■	■						
10	Report writing					■	■	■	■	■			
11	Draft report submitted to PNIPH										■		
12	Stakeholder validation meeting											■	
13	Final report											■	■

Measures to be taken in the event of delays/unforeseen developments

Risk	Probability	Consequence	Mitigation
COVID-19 restrictions may hinder data collection and stakeholder (and patient) engagement in the West Bank.	High	Delays in analysis and reporting	Use remote solutions; risks factored into timelines.
One or more of the HTA team will not be able to complete the tasks on time (sick leave, parental leave, dismissal).	Fair	Missed milestones and activity specific deliverables.	Common collaboration folder, regular updates given and all members kept up to speed.

Deliverables and publication

Study findings will be presented to stakeholders in Palestine for validation. The full-HTA report (outline in Appendix 5) including an Arabic summary will be published at least on the websites of both PNIPH and NIPH. A policy brief (maximum two-four pages) will be prepared for policy makers and results will be widely disseminated locally and internationally.

Keyword: Breast Cancer Screening; Mammography; Palestine; West Bank; Adaptation; Health Technology Assessment; Budget Impact Analysis

References

1. Ferlay J, Ervik M, Lam F, Colombet M, Mery L, Piñeros M, et al. Global Cancer Observatory: Cancer Today Lyon, France: International Agency for Research on Cancer,; 2018 [Available from: https://gco.iarc.fr/today.
2. Halahleh K, Gale RP. Cancer care in the Palestinian territories. The Lancet Oncology. 2018;19(7):e359-e64.
3. Palestinian National Institute of Public Health. Producing evidence to advance mammography screening in Palestine n.d. [Available from: https://www.pniph.org/en/impacts/producing-evidence-to-advance-mammography-screening-in-palestine.
4. Palestinian National Institute of Public Health. Performance of mammography screening in the national breast screening program: A retrospective cohort study. World Health Organization,; 2014.
5. Jubran J, Shaar AN, Hammad S, Jarrar K. Pathway to Survival - the Story of Breast Cancer in Palestine. 2018.
6. Bhikoo R, Srinivasa S, Yu TC, Moss D, Hill AG. Systematic review of breast cancer biology in developing countries (part 1): Africa, the middle East, eastern europe, Mexico, the Caribbean and South america. Cancers (Basel). 2011;3(2):2358-81.
7. Azaiza F, Cohen M, Awad M, Daoud F. Factors associated with low screening for breast cancer in the Palestinian Authority: relations of availability, environmental barriers, and cancer-related fatalism. Cancer. 2010;116(19):4646-55.
8. Schünemann HJ, Lerda D, Dimitrova N, Alonso-Coello P, Gräwingholt A, Quinn C, et al. Methods for development of the European Commission initiative on breast Cancer guidelines: recommendations in the era of guideline transparency. Annals of Internal Medicine. 2019;171(4):273-80.
9. Schünemann HJ, Lerda D, Quinn C, Follmann M, Alonso-Coello P, Rossi PG, et al. Breast cancer screening and diagnosis: a synopsis of the European Breast Guidelines. Annals of internal medicine. 2020;172(1):46-56.
10. Guegan E, Milne R, Pordage A. EUnetHTA HTA Adaptation Toolkit & Glossary: Revised Version 5. UK: EUnetHTA; 2011.
11. EUnetHTA JAWP5. The HTA Core Model® for Rapid Relative Effectiveness Assessments (version 4.2). 2015.

Appendices

Appendix I: Search strategies

Strategy for systematic reviews and HTAs

Database: PubMed
Date: 26.09.2019
Hits: 284

Search	Query	Items found
#19	Search (#16) OR #17 Filters: Publication date from 2016/01/01 to 2019/12/31	284
#18	Search (#16) OR #17	866
#17	Search (systematic[sb]) AND #14	334
#16	Search (#14) AND #15	861
#15	Search Meta-Analysis[Mesh:NoExp] or systematic* review*[Title/Abstract] or metaanal*[Title/Abstract] or meta anal*[Title/Abstract] or (review[Title/Abstract] and (structured search*[Title/Abstract] or database* search*[Title/Abstract] or systematic* search*[Title/Abstract])) or integrative review*[Title/Abstract] or evidence review*[Title/Abstract]	314500
#14	Search (#3) OR #13	54158
#13	Search ((#6) OR #9) AND #12	23989
#12	Search (#10) OR #11	381958
#11	Search (breast cancer[Title/Abstract] OR breast neoplasm*[Title/Abstract] OR breast tumo*[Title/Abstract] OR mammary cancer*[Title/Abstract] OR malignant neoplasm* of breast[Title/Abstract] OR malignant tumo* of breast[Title/Abstract] OR breast malignant tumo*[Title/Abstract] OR cancer of breast[Title/Abstract] OR human mammary carcinoma[Title/Abstract] OR cancer breast[Title/Abstract] OR breast malignant neoplasm[Title/Abstract] OR breast malignant neoplasms[Title/Abstract] OR cancer mammary[Title/Abstract] OR cancers mammary[Title/Abstract] OR mammary Carcinoma[Title/Abstract] OR mammary Carcinomas[Title/Abstract] OR mammary neoplasm[Title/Abstract] OR mammary neoplasms[Title/Abstract] OR breast carcinoma[Title/Abstract] OR breast carcinomas[Title/Abstract] OR mammary tumo*[Title/Abstract])	313654
#10	Search breast neoplasm[MeSH Terms]	281275
#9	Search (#7) OR #8	575858
#8	Search (Ultrasound [Title/Abstract] OR Echography[Title/Abstract] OR Ultrasonic Imag*[Title/Abstract] OR Medical Sonography[Title/Abstract] OR Ultrasonic Diagnos*[Title/Abstract] OR Computer Echotomography[Title/Abstract] OR Ultrasonic Tomography[Title/Abstract] OR breast imaging*[Title/Abstract] OR ultrasonography[Title/Abstract] OR Sonography[Title/Abstract] OR sonography medical[Title/Abstract])	343687

Search	Query	Items found
#7	Search ("Ultrasonography, mammary"[MeSH Terms]) OR "ultrasonography"[MeSH Terms]	422458
#6	Search (#4) OR #5	751901
#5	Search magnetic resonance Imag*[Title/Abstract] OR magnetic resonance spectroscop*[Title/Abstract] OR magnetic resonance tomograph*[Title/Abstract] OR NMR[Title/Abstract] OR NMRs[Title/Abstract] OR MRI[Title/Abstract] OR MRIs[Title/Abstract] OR fMRI[Title/Abstract] OR fMRIs[Title/Abstract] OR MR tomograph*[Title/Abstract] OR MR imag*[Title/Abstract] OR MR scan[Title/Abstract] OR MR scans[Title/Abstract] OR Zeugmatograph*[Title/Abstract] OR chemical shift Imag*[Title/Abstract] OR proton spin Tomograph*[Title/Abstract] OR spin echo Imag*[Title/Abstract] OR diffusion Tractograph*[Title/Abstract] OR echo planar Imag*[Title/Abstract] OR echoplanar Imag*[Title/Abstract] OR magnetic resonance Angiograph*[Title/Abstract] OR magnetization transfer contrast Imag*[Title/Abstract] OR MR scanning*[Title/Abstract] OR magnetic resonance scan*[Title/Abstract]	599173
#4	Search ("Magnetic Resonance Imaging"[Mesh:NoExp] or "Diffusion Magnetic Resonance Imaging"[Mesh:NoExp] or "Diffusion Tensor Imaging"[Mesh:NoExp] or "Echo-Planar Imaging"[Mesh:NoExp] or "Fluorine-19 Magnetic Resonance Imaging"[Mesh:NoExp] or "Magnetic Resonance Angiography"[Mesh:NoExp] or "Magnetic Resonance Imaging, Cine"[Mesh:NoExp])	428952
#3	Search (#1) OR #2	38287
#2	Search (mammograph*[Title/Abstract] or xeromammograph*[Title/Abstract] or digital breast tomosynthes*[Title/Abstract])	28705
#1	Search (mammography[MeSH Terms]) OR xeromammography[MeSH Terms]	29082

Database: Cochrane Database of Systematic Reviews
Date: 26.09.2019
Hits: 61

Search	**Query**	**Items found**
#1	[mh ^Mammography]]	764
#2	[mh ^xeromammography]	5
#3	(mammograph* or xeromammograph* or "digital breast tomosynthes*"):ti,ab	1967
#4	#1 OR #2 OR #3	2095
#5	[mh ^"Magnetic Resonance Imaging"]	6882
#6	[mh ^"Diffusion Magnetic Resonance Imaging"]	237
#7	[mh ^"Diffusion Tensor Imaging"]	119
#8	[mh ^"Echo-Planar Imaging"]	82
#9	[mh ^"Fluorine-19 Magnetic Resonance Imaging"]	0
#10	[mh ^"Magnetic Resonance Angiography"]	434
#11	[mh ^"Magnetic Resonance Imaging, Cine"]	229

#12	("Magnetic Resonance Imag*" or "magnetic resonance spectroscop*" or "magnetic resonance tomograph*" or "NMR" or "NMRs" or "MRI" or "MRIs" or "fMRI" or "fMRIs" or "MR tomograph*" or "MR imag*" or "MR scan" or "MR scanning*" or "MR scans" or "Zeugmatograph*" or "Chemical Shift Imag*" or "Proton Spin Tomograph*" or "Magnetization Transfer Contrast Imag*" or "Spin Echo Imag*" or "Diffusion Tractograph*" or "Echo Planar Imag*" or "Echoplanar Imag*" or "Magnetic Resonance Angiograph*" or "Magnetic resonance scan*"):ti,ab	22760
#13	#5 OR #6 OR #7 OR #8 OR #9 OR # 10 OR # 11 OR #12	967446
#14	[mh ^"Ultrasonography, Mammary"]	72
#15	[mh ^Ultrasonography]	4690
#16	("ultrasound" or "echography" or "ultrasonic imag*" or "medical sonography" or "ultrasonic diagnos*" or "computer echotomography" or "ultrasonic tomography" or "breast imaging*" or "ultrasonography" or "Sonography" or "sonography medical"):ti,ab	32158
#17	#14 OR #15 OR #16	33753
#18	[mh ^"breast neoplasm"]	11727
#19	(“Breast cancer” or “breast neoplasm*” or “Breast Tumo*” or “Mammary Cancer*” or “Malignant Neoplasm* of Breast” or “Malignant Tumo* of Breast” or “Breast Malignant Tumo*” or “Cancer of Breast” or “Human Mammary Carcinoma” or ”mammary tumo*” or “cancer breast” or “breast malignant neoplasm*” or “cancer* mammary” or "mammary Carcinoma*" or "mammary neoplasm*" or "breast carcinoma*" or "mammary tumo*"):ti,ab	30643
#20	#18 OR #19	31978
#21	#13 OR #17	976899
#22	#20 AND #21	20519
#23	#4 OR #22	21416
#24	#4 OR #22 with Cochrane Library publication date from Jan 2016 to Dec 2019, in Cochrane Reviews and Cochrane Protocols	61

Database: Epistemonikos
Date: 26.09.2019
Hits: 240

Title/Abstract: ("Magnetic resonance imaging" OR "magnetic resonance imagings" OR "MR scanning" OR "MR scannings" OR "magnetic resonance image" OR "magnetic resonance images" OR "magnetic resonance spectroscopy" OR "magnetic resonance tomography" OR NMR OR NMRs OR MRI OR MRIs OR fMRI OR fMRIs OR "MR tomography" OR "MR Imaging" OR "MR Imagings" OR "MR Image" OR "MR Images" OR "MR scan" OR "MR scans" OR Zeugmatograph* OR "Chemical Shift Imaging" OR "Chemical Shift Imagings" OR "Chemical Shift Image" OR "Chemical Shift Images" OR "Proton Spin Tomography") AND ("Breast Tumour" OR "Breast Tumours" OR "breast malignant tumour" OR "breast malignant tumours" OR "malignant tumour of breast" OR "malignant tumours of breast" OR "mammary tumour" OR "mammary tumours" OR "Breast cancer" OR "Breast Neoplasm" OR "Breast Neoplasms" OR "Breast Tumor" OR "Breast Tumors" OR "breast malignant tumor" OR "breast malignant tumors" OR "malignant tumor of breast" OR "malignant tumors of breast" OR "malignant neoplasm of breast" OR "malignant neoplasms of breast" OR "Mammary Cancer" OR "Cancer of Breast" OR "Cancer breast" OR "breast malignant neoplasm" OR "breast malignant neoplasms" OR "cancer mammary" OR "cancers mammary" OR "mammary Carcinoma" OR "mammary Carcinomas" OR "mammary neoplasm" OR "mammary neoplasms" OR "breast carcinoma" OR "breast carcinomas" OR "mammary tumor" OR "mammary

tumors") - limit to: 2016-2019 = 64 (61 Systematic Reviews, 2 Structured Summary, 1 Broad synthesis)

Title/Abstract: ("Magnetization Transfer Contrast Imaging" OR "Magnetization Transfer Contrast Imagings" OR "Magnetization Transfer Contrast Image" OR "Magnetization Transfer Contrast Images" OR "Spin Echo Imaging" OR "Spin Echo Imagings" OR "Spin Echo Image" OR "Spin Echo Images" OR "Diffusion Tractography" OR "Echo Planar Imaging" OR "Echo Planar Imagings" OR "Echo Planar Image" OR "Echo Planar Images" OR "Echoplanar Imaging" OR "Echoplanar Imagings" OR "Echoplanar Image" OR "Echoplanar Images" OR "Magnetic Resonance Angiography" OR "Ultrasound" OR "Echography" OR "breast imaging" OR "Medical Sonography" OR "Ultrasonic Diagnosis" OR "ultrasonography" OR "ultrasonic imagings" OR Sonography OR "breast imagings" OR "computer echotomagraphy" OR "ultrasonic imaging" OR "sonography medical" OR "Ultrasonic Tomography") AND ("Breast Tumour" OR "Breast Tumours" OR "breast malignant tumour" OR "breast malignant tumours" OR "malignant tumour of breast" OR "malignant tumours of breast" OR "mammary tumour" OR "mammary tumours" OR "Breast cancer" OR "Breast Neoplasm" OR "Breast Neoplasms" OR "Breast Tumor" OR "Breast Tumors" OR "breast malignant tumor" OR "breast malignant tumors" OR "malignant tumor of breast" OR "malignant tumors of breast" OR "malignant neoplasm of breast" OR "malignant neoplasms of breast" OR "Mammary Cancer" OR "Cancer of Breast" OR "Cancer breast" OR "breast malignant neoplasm" OR "breast malignant neoplasms" OR "cancer mammary" OR "cancers mammary" OR "mammary Carcinoma" OR "mammary Carcinomas" OR "mammary neoplasm" OR "mammary neoplasms" OR "breast carcinoma" OR "breast carcinomas" OR "mammary tumor" OR "mammary tumors") - limit to: 2016-2019 = 46 (43 Systematic Reviews, 2 Structured Summaries, 1 Broad synthesis)

Title/Abstract: (mammograph* or xeromammograph* or "digital breast tomosynthesis" or "digital breast tomosyntheses") - limit to: 2016-2019 = 130 (121 Systematic Reviews, 4 Structured Summaries, 5 Broad synthesis)

Search strategy for breast cancer screening guidelines

Search strategy for breast cancer screening guidelines

Database	Search string(s)	Number of hits
TRIP+ http://www.tripdatabase.com/	**1** mammography **2** ("Magnetic resonance imaging" OR MRI OR ultrasound) AND "breast cancer"	**1** 159 **2** 440
NHS Evidence in Health and Social Care http://www.evidence.nhs.uk/default.aspx	**1** mammography **2** ("Magnetic resonance imaging" OR MRI OR ultrasound) AND "breast cancer"	**1** 93 **2** 224
G-I-N https://g-i-n.net/	**1** mammography **2** ("Magnetic resonance imaging" OR MRI OR ultrasound OR screening) AND "breast cancer"	**1** 4 **2** 23
NICE (UK) http://www.nice.org.uk/	**1** mammography **2** ("Magnetic resonance imaging" OR MRI OR ultrasound OR screening) AND "breast cancer"	**1** 6 **2** 14
Guideline central	**1** mammography **2** breast cancer	**1** 1 **2** 36

https://www.guidelinecentral.com/summaries/		
UpToDate https://www.uptodate.com/contents/search	breast cancer screening	4 relevant UpToDate-articles and 1 collection of guidelines
WHO IRIS (Institutional repository for information sharing) http://apps.who.int/iris	**1** All of IRIS: mammography **2** All of IRIS: Magnetic resonance imaging. Filter by Title contains: breast **3** All of IRIS: MRI. Filter by Title contains: breast **4** All of IRIS: ultrasound. Filter by Title contains: breast	**1** 503 **2** 3 **3** 5 **4** 11
European Commission Initiative on Breast Cancer https://healthcare-quality.jrc.ec.europa.eu/	**1** mammography **2** MRI **3** Magnetic resonance imaging **4** ultrasound **5** screening	**1** 50 **2** 7 **3** 7 **4** 9 **5** 118

Appendix 2: Checklists for HTA Adaptation

Assessing the technology use domain

Below is a list of seven questions to ask when considering the adaptation of information and/or data on technology use. Answers to these questions should help extract information from the identified source, to be incorporated in the Palestinian HTA report. There may be a need to update some data and supplement it with local context data.

a) To assess relevance:
1. What is the research question considered? Is the research question considered relevant to our question?
b) To assess reliability:
2. Were conditions, target group, relevant interventions or comparisons between interventions and relevant outcomes appropriately defined?
3. Is the information provided on technology use and development complete and comprehensive? Are the methods and sources used when elaborating the background information well documented?
4. Are patterns of utilization, diffusion, indications and time trends adequately described?
5. Is an analysis of the regulatory status of the technology provided (market admission, status in other countries)?
c) To assess transferability:
6. Is there any consideration of when and how technical characteristics affect outcomes?
7. Are there any differences in the use of this technology within the target setting (compared to the uses described in the HTA report for adaptation)?

Assessing the safety domain

Below is a list of questions to ask when considering the adaptation of information on safety.

a) To assess relevance
1. Were harms or safety assessed?
2. Is the scope of the safety assessment relevant to your question?
b) To assess reliability
3. Was the search for studies reasonably comprehensive?
4. Were special sources consulted? E.g., disease registers, routinely data collected (on utilization, costs, adverse effects, etc.), consumer associations, etc.
5. What are the sources of information/data? E.g., surveillance databases, declaration of incidents, safety report, RCT, case reports
6. Were the criteria used for deciding which studies to include in the HTA report reported?
7. Was bias in the selection of studies avoided?
8. Did the selection of studies (in particular the choice of eligible study designs) minimize the possibility of including studies with a high propensity for bias?
9. Were the criteria used for assessing the validity of the included studies reported?
10. a) Were the inclusion criteria used for the primary studies appropriate to the study question posed by the HTA report? b) Were the criteria used to assess the validity of the primary study appropriate?
11. Which risks have been reported and how were they measured?
12. a) Were the study outcomes valid? b) Were the study outcomes pertinent?
13. Are the number of patients, their representativeness and the quality of the data high enough to exclude a modest but clinically relevant rate of serious complications? I.e., what is the potential for overlooking a possible serious adverse event?
14. Is there a possibility for a 'class' effect adverse reaction or safety problem?
c) To assess transferability

15. Does the population described for eligibility match the population to which it is targeted in the target setting?
16. Are there any reasons to expect differences in complication rates (e.g. epidemiology, genetic issues, healthcare system (quality of care, surveillance))?
17. Are the requirements for its use (special measures needed for use/implementation, maintenance etc.) available in the target setting?
18. Is the necessary expertise (knowledge and skills) available in the target setting?
19. a) Is safety particularly dependent on training? b) Are there types of teams to which the procedure should be limited for safety reasons? c) Is there a need for special training or certification to deliver the intervention properly? d) Would it be possible (affordable) to organize such training, if any?

Assessing clinical effectiveness

Below is a list of relevance, reliability and transferability questions to ask when considering the adaptation of information and/or data on effectiveness and efficacy.

a) To assess relevance
1. a) What is the research question considered? b) Is the research question considered within this section of the HTA report relevant to your HTA question?
2. Are the outcome measures relevant for your HTA question?
3. Were the search methods used to find studies relevant to the main question(s) stated?
b) To assess reliability
4. Was the search for studies reasonably comprehensive?
5. Were the criteria used for deciding which studies to include in the HTA report reported?
6. Was bias in the selection of studies avoided?
7. Did the selection of studies (in particular the choice of eligible study designs) minimize the possibility of including studies with a high propensity for bias?
8. Were the criteria used for assessing the validity of the included studies reported?
9. Was the validity of all studies referred to in the text assessed using appropriate criteria (in selecting studies either for inclusion or in analyzing the studies that are cited)?
10. Were the methods used to combine the findings of the relevant studies (to reach a conclusion) reported?
11. Were the findings of the relevant studies combined appropriately with respect to the main question the HTA report addresses?
12. Were the conclusions made by the authors supported by the data and/or analysis reported in the HTA report?
13. How likely is it that the relevance of this HTA report has changed due to additional research that had started, completed or been published since this Health Technology Assessment report?
c) To assess transferability
14. Would you expect the baseline risk of patients within your own setting to be the same as the baseline risk of those patients considered within the HTA report for adaptation? (assuming that patients receive the same treatment and same comparator)

Appendix 3: Questions to aid data extraction

Adapted from EUnetHTA: HTA Core Model for Rapid Relative Effectiveness (11)

Topic	Question
Description and technical characteristics of the technology	
Features of the technology	What types of mammography are available and are there other test/comparators?
Features of the technology	What is the claimed benefit of the mammography in relation to the comparator(s)?
Features of the technology	Who administers the mammography and the comparator(s) and in what context and level of care are they provided?
Investments and tools required to use the technology	What kind of special premises are needed to use mammography and the comparator(s)?
Investments and tools required to use the technology	What equipment and supplies are needed to use mammography and the comparator(s)?
Regulatory status	What is the reimbursement status of the mammography?
Health problem and current use of technology	
Target condition	What are the known risk factors for breast cancer?
Target condition	What is the natural course of breast cancer?
Target condition	What are the symptoms and the burden of disease or health condition for the patient?
Target condition	What are the consequences of breast cancer for the society?
Current management of the condition	How is breast cancer currently diagnosed according to published guidelines and in practice?
Current management of the condition	How is breast cancer currently managed according to published guidelines and in practice?
Target population	What is the target population in this assessment?
Target population	How many people belong to the target population?
Utilization	How much is mammography utilized?
Safety	
Patient safety	How safe is mammography in relation to the comparator(s)?
Patient safety	Are the harms related to frequency of mammography?
Patient safety	How does the frequency or severity of harms change over time or in different settings?
Patient safety	What are the susceptible patient groups that are more likely to be harmed through the use of mammography?
Patient safety	Are mammography and comparator(s) associated with user dependent harms?
Safety risk management	What kind of data/records and/or registry is needed to monitor the use of mammography and the comparator(s)?
Patient safety	What are the consequences of false-positive, false negative and incidental findings generated by using mammography from the viewpoint of patient safety?
Clinical effectiveness	
Mortality	What is the expected beneficial effect of mammography on mortality?
Morbidity	How does mammography affect symptoms and findings (severity, frequency) of breast cancer?
Morbidity	How does mammography affect progression (or recurrence) of the disease or health condition?
Function	What is the effect of mammography on patients' body functions?
Function	How does the use of mammography affect activities of daily living?
Health related quality of life	What is the effect of mammography on generic health-related quality of life?

Health related quality of life	What is the effect of mammography on disease-specific quality of life?
Patient satisfaction	Were patients satisfied with mammography?
Test accuracy	What is the accuracy of mammography against reference standard?
Test accuracy	What is the optimal threshold value in this context?
Costs	
	What is the price of the technology being assessed and its comparators?
	What are the total costs per patient of the intervention in relation to its comparators?
	What is the budget impact of the intervention?
	What type of uncertainty is associated with cost and budget impact estimates?
Cost-effectiveness	
	What are the expected benefits and costs associated with the technology being assessed and its comparators?
	What is the incremental cost-effectiveness ratio (ICER) of the technology being assessed in relation to its comparators? What type of uncertainty (methodological, structural and parameter) is associated with the ICER estimate?
	Is the cost-effectiveness of the intervention different between patient groups (subgroups)?
Other factors (when necessary)	
	Are there any ethical, organizational, social or legal aspects specific to the intervention that should be taken into consideration in assessment?
	Is the intervention associated with any specific patient perspectives that should be taken into consideration in assessment?

Appendix 4: Development of the Research Question

October: Consensus Meeting between PNIPH & NIPH

What is the appropriate age to use Mammography screening in Palestine?

November: Internal Inception Report

Primary questions:

- Should organized mammography screening in women be used?
    - Sub-questions:
        - Should mammography screening vs. no mammography screening be used for early detection of breast cancer in women aged 40 to 44?
        - Should mammography screening vs. no mammography screening be used for early detection of breast cancer in women aged 45 to 49?
        - Should mammography screening vs. no mammography screening be used for early detection of breast cancer in women between the ages of 50 and 69?
        - Should mammography screening vs. no mammography screening be used for early detection of breast cancer in women 70 years of age and older?
- What is the cost-effectiveness (and/or budget impact) of mammography screening compared to no mammography screening in Palestinian women?

Secondary questions:

- How often should women attend an organized mammography screening program?
    - Sub-questions:
        - Should screening once a year vs. other screening frequencies be used for screening asymptomatic women aged 45-49?
        - Should screening once a year vs. other screening frequencies be used for screening asymptomatic women aged 50-69?
        - Should screening once a year vs. other screening frequencies be used for screening asymptomatic women aged 70-74?

Further questions:

- What tests should be used to screen for breast cancer?
- What tests should be used to screen for breast cancer in women with dense breast tissue?

December: Core team meetings (with approval of others)

Primary research question:

- Should organized mammography vs no mammography screening be used for early detection of breast cancer in women aged 40 to 75 years in the West Bank?

Secondary research questions:

- What is the recommend frequency of screening to be used for early detection of breast cancer in women aged 40 to 75 years in the West Bank?
- What is the associated financial cost if screening is to be used for early detection of breast cancer in women aged 40 to 75 years in the West Bank?

Appendix 5: Proposed report outline

KEY MESSAGE
EXECUTIVE SUMMARY
LIST OF ABBREVIATIONS
PREFACE
1 BACKGROUND
1.1 OVERVIEW OF THE DISEASE, HEALTH CONDITION AND TARGET POPULATION
- 1.1.1 Description of the health condition: Breast cancer
- 1.1.2 Risk factors for breast cancer
- 1.1.3 Consequences of breast cancer
- 1.1.4 Burden of breast cancer
- 1.1.4 Target population in this assessment

1.2 FEATURES OF THE INTERVENTION
- 1.3.1 Breast cancer screening
- 1.3.2 Guidelines on breast cancer screening
- 1.3.3 Screening technologies
- 1.3.4 Setting and requirements

1.3 CURRENT CLINICAL PRACTICE
- 1.2.1 Diagnosis
- 1.2.2 Treatment

2 OBJECTIVES AND SCOPE
3 METHODS
3.1 CLINICAL EFFECTIVENESS AND SAFETY
- 3.1.1 Information retrieval
- 3.1.2 Selection of relevant studies and documents
- 3.1.3 Data extraction
- 3.1.4 Quality rating
- 3.1.5 Data analyses and synthesis
- 3.1.7 External expert involvement

3.2 ECONOMIC EVALUATION
3.3 DIVISION OF WORK WITHIN THE PROJECT
3.4 DEVIATIONS FROM THE PROJECT PLAN
4 RESULTS: CLINICAL EFFECTIVENESS AND SAFETY
4.1 CLINICAL EFFECTIVENESS
- 4.1.1 Description of the evidence synthesis
- 4.1.2 Results on clinical effectiveness and safety
  - 4.1.2.1 Mortality
  - 4.1.2.2 Morbidity
  - 4.1.2.3 Harms resulting from treatment
  - 4.1.2.4 Health-related quality of life
- 4.1.3 Summary
  - 4.1.3.1 Balancing of benefits and harms
  - 4.1.3.2 Other risk factors
  - 4.1.3.3 Conclusion

4.2 ECONOMIC EVALUATION
- 4.2.1 Intervention cost
- 4.2.2 Budget Impact
- 4.2.3 Uncertainty

5 DISCUSSION
6 CONCLUDING SUMMARY
7 REFERENCES