

Protocol for “Effects of policy on fertility: A systematic review of (quasi)experiments”*

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1. Introduction

The decline of fertility below replacement levels has been met with concern in several advanced economies. At the same time, many of these countries allocate large budget shares to family support in different forms, often with the explicit or implicit expectation that such support will increase fertility levels or at least impede further decline (United Nations 2018). This expectation finds support in cross-country studies showing that extensive public support to families correlates with higher fertility (e.g. Kalwij 2010). This literature review synthesizes studies that take an experimental or quasi-experimental approach in studying the effect of policy on fertility. For external validity, our review is limited to countries within Europe, USA, Canada, and Australia. Hence, our systematic review complements a vast literature of comparisons between these countries and across time, deepening our understanding of the interplay between public policy and fertility decisions.

This project is pre-registered at PROSPERO (Hart, Bergsvik & Fauske 2019). The protocol provides details on the process of searching and sorting beyond those provided in the pre-registration.

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2. Methods for search and sorting

Three researchers contributed to the processes of search and sorting; Agnes Fauske (AF), Janna Bergsvik (JB) and Rannveig Hart (RH). In addition, we received help from a librarian at the Norwegian Institute of Public Health, with specific competence in systematic searches.

2.1 Bibliographic database search

The search was carried out using relevant social and medical science databases. The databases used in this systematic review were Epistemonikos (<https://www.epistemonikos.org/>), Social services abstracts (<https://search.proquest.com/socialservices>), Cochrane library (<https://www.cochranelibrary.com/>), Medline (<http://ovidsp.tx.ovid.com>), Web of Science (<http://apps.webofknowledge.com>), Popline (<https://www.popline.org/>) and Sociological abstracts (<https://search.proquest.com/socabs>).

The first step of the database search was made by the library at the Norwegian Institute of Public Health, using a search string constraining methods to those with potential for causal inference and outcomes to various measures of fertility. No constraints were set for the explanatory variable (intervention). Details on the search are found in Appendix 1, and the hits for each database are described in Table 1.

The next step in the database search contained two more specific search strings made by JB, AF and RH. In these searches, we extended and the library's search string to also specify keywords for interventions. Some modifications to the outcome and methods strings for increased precision were also done, based on experience with the first search. We made topic-specific searches first, for different family policies and, second, the matter of housing. AF conducted this search. Search strings are found in Appendix 2 and 3, and hits by the database are shown in Table 1.

Together, these searches generated 16 755 unique articles (Table 1). Articles that were captured by one or more search were included in the first search.

Searches for recent working papers was done in EconPapers (<https://econpapers.repec.org>), which indexes RePec (www.repec.org), a collection of online working paper depositories. Details on this search are given in Appendix 4. Table 1 shows that this search yielded 473 hits and how these were distributed by the search string. In total, 17 228 articles were obtained by database searches (Table 1).

Table 1: Hits by search string and database

PANEL A: PUBLISHED ARTICLES		
Basic	WoS	1795
	SSA	868
	ChL	1044
	Epistemonikos	112
	Medline	2518
	Medline	1833
	Medline	3551
Total basic		11721
Family policy	WoS	1457
	Medline	53
	SSA	10
	ChL - cochrane library	6
	Epistemonikos	0
	Sociological abstracts	1435
	Popline	1950
Total policy		4911
Housing	Sociological abstracts	66
	WoS	38
	Medline	14
	SSA	5
	Epistemonikos	0
	Popline	0
	ChL	0
Total housing		123
Total published		16755
PANEL B: WORKING PAPERS		
Basic search	RePec	216
Family policy search	RePec	198
Housing search	RePec	59
Total WPs		473
Total databases		17228

2.2 Selection

We included studies that fulfilled the following PICOS criteria, i.e. criteria on Participants, Intervention, Comparison, Outcomes and Study design (Liberati et al. 2009). Table 2 describes these criteria. Some comments on the table are warranted.

First, regarding participants, studies devoted to teenage pregnancies exclusively are excluded as this literature is near entirely devoted to the prevention of births, often in ways that cannot be inverted to mean incentives to births. (For instance, while giving teens information of contraception may prevent teenage pregnancies, *withdrawing* information of contraception from women in their 30s is unlikely to increase their fertility, and raises an array of ethical issues.) As we did not want to deal with a selected part of the literature on teenage pregnancies, we excluded articles with teenage pregnancy as their main topic.

Second, studies using empirical data from Romania were also excluded, due to a particularly coercive pro-natalist regime under Ceaușescu that may generally limit external validity.

Regarding interventions, we exclude studies that directly limit participants free choice by restricting access to contraception or abortion. Articles on the general effects of (subsidised) access to health services, including assisted reproductive technologies (ART), were included.

Further, interventions are excluded if the intervention effect on fertility is unduly complex, or indirect, or if the intervention a priori is an inefficient means of affecting fertility. This criterion excludes for example effects of educational attainment, income, and economic recession/economic uncertainty. For these factors, there are also other excellent literature reviews (see e.g. Sobotka, Skirbekk & Philipov 2011). Policies modifying the effects of these factors – i. e. changes in unemployment benefits – were considered within the scope of our review.

Reviews were included if they were published in the year 2000 or later. We did not condition on reviews being systematic in a strict sense as that has been extremely rare in this field, and would have led to the exclusion of valuable information). Shorter country-specific reviews (often as a part of a description of demographic trends in that country) were included if published within the last ten years (since 2009).

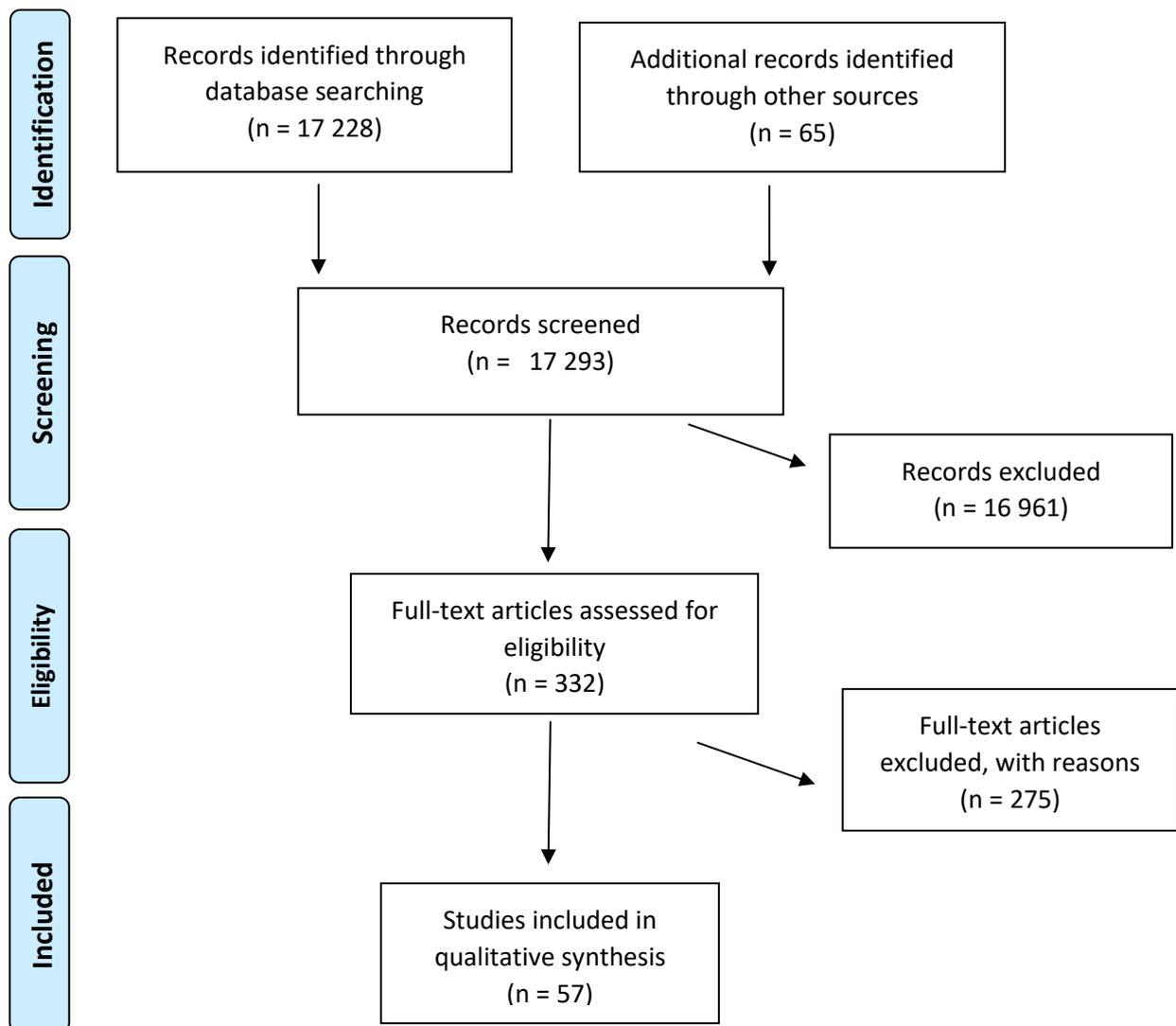
Table 2: PICOS for inclusion and exclusion.

CRITERIA	INCLUSION	EXCLUSION
PARTICIPANTS (POPULATION)	<ol style="list-style-type: none"> 1. Populations of nations fully located in Europe (excluding e.g. Turkey and Russia), Northern America (Canada and USA) and Australia. 2. Women or men of childbearing age during the intervention. 	<ol style="list-style-type: none"> 1. Teenage pregnancies. 2. Romania, due to a particularly coercive pro-natalist regime under Ceausescu that may generally limit external validity.
INTERVENTIONS	<ol style="list-style-type: none"> 1. Intervention is a policy, implemented at the national, regional or local level. 2. Intervention happened after 1970. 3. The intervention affects the fertility choices of the population. 	<ol style="list-style-type: none"> 1. The intervention directly limits participants free choice by restricting access to contraception or abortion. 2. The intervention effects on fertility are unduly complex or indirect, making the intervention an obviously inefficient means of achieving higher fertility.
COMPARATOR/ CONTROL	<ol style="list-style-type: none"> 1. The introduction/revocation of a policy is compared to the absence/presence of the same policy. 2. Modifications of a policy are compared to the same policy in its previous form. 3. Two different policy treatments are compared. 	
OUTCOMES	<ol style="list-style-type: none"> 1. Birth rates measured at aggregate (sub-national) level. 2. Birth probabilities measured at individual level. 3. Period (“timing”) measures. 4. Cohort (“quantum”) measures. 	<ol style="list-style-type: none"> 1. Outcome is measured at country level.
STUDY DESIGN	<ol style="list-style-type: none"> 1. Field experiments 2. Quasi-experiments: difference-in-differences, regression discontinuity and instrumental variable design, and any combination of these 3. Two-way fixed effects, or area fixed effects with detailed controls for period and cohort. 	<ol style="list-style-type: none"> 1. Observational studies that do not use the strategies mentioned for causal identification 2. Fixed effects are measured at a higher level than treatment.

2.3 Screening process

The PRISMA diagram in Figure 1 documents the screening process. AF and RH screened all titles and (when available) abstracts, using the web application Rayyan, tailored for screening systematic reviews (Ouzzani, 2016). Based on relevance and methods, articles were categorized to be excluded or included for full-text reading. If both screeners independently made the same classification, it was considered conclusive. AF and RH discussed conflicting conclusions. If the discussion did not resolve the disagreement, JB made a final decision. In line with our search criteria, articles written in languages other than English, Norwegian, Swedish or Danish, were excluded.

Figure 1: PRISMA diagram



From: Moher, Liberati, Tetzlaff, Altman, The PRISMA Group (2009).

Based on the searches in published articles, 332 articles were selected for full-text reading (Figure 1), of which 19 stemmed from the working paper search. Each of these articles was read in full text by two researchers, who independently judged inclusion or exclusion. Conflicting conclusions were resolved by discussion, alternatively by the third researcher.

When a study was included in the sample, its reference list was screened for relevant articles. Articles were selected for abstract screening based on title and description in the citing study. 65 articles sorted in for full-text reading based on abstract screening were read in full text and independently assessed by JB and RH, who made a final decision on inclusion and exclusion through discussion. Our final study sample consisted of 57 articles (Figure 1).

2.4 Quality assessment

Throughout the screening process, the methodological quality and approach of the studies have been assessed. In the final reading and synthesis of the selected papers, identification strategies will be scrutinized even more closely. Articles with robust identification strategies will be given more weight in the final synthesis, i.e. if robustness checks were done for fertility outcomes specifically and linked to the subgroups/outcome where a significant effect (if any) was found. If effects in opposite directions emerge, results that were deemed unlikely to suffer from bias were given more weight in the narrative synthesis.

2.5 Narrative synthesis

Our analysis of the material is a narrative synthesis guided by the four steps developed by Popay et al. (2006, see also Ryan 2016). First, we will establish a theoretical framework for the interpretation of result. We will also give a detailed description of each of the included studies in terms of both text and overview tables, structured by type of intervention. The final discussion will focus on patterns in data, in terms of intervention type, evaluation design, context and subgroups. We will also critically assess the completeness of evidence, and variation in this across the types of intervention, as well as our applied methods for evaluation of bias (i.e. the validity of the identification strategies).

3. Conclusion

This protocol has provided details on the search and sort strategies for our systematic review of policy effects on fertility. Results from the review will be presented in a separate publication.

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Appendix 1: Additional information on the basic search

Database: Web of Science

Search date: 2019-02-15

3 **1,804** #2 AND #1

Indexes=SCI-EXPANDED, SSCI Timespan=All years

2 **16,624,048** **TOPIC:** (randomized or randomised or randomly or trial or intervention* or controlled or "control group" or "control groups" or quasiexperiment or experiment* or evaluat* or effect* or "instrumental variables" or "regression discontinuity" or "difference in difference" or "diff in diff" or "identification strategy")

Indexes=SCI-EXPANDED, SSCI Timespan=All years

1 **2,992** **TOPIC:** (((birth-rate* or fertility-rate*) NEAR/5 (declin* or increas* or reduc* or improv*)) or "completed fertility" or "parity progression" or "total fertility rate" or "cohort fertility rate" or "lifetime fertility")

Indexes=SCI-EXPANDED, SSCI Timespan=All years

Database: Social Services Abstracts

Search date: 2019-02-20

("birth rate" OR "birth rates" OR "fertility rate" OR "fertility rates") AND (declin* OR increas* OR improv* OR reduc*) OR "completed fertility" OR "parity progression" OR "total fertility rate" OR "cohort fertility rate" OR "lifetime fertility" : 998

Database: Sociological Abstracts

Search date: 2019-03-14

((("birth rate" OR "birth rates" OR "fertility rate" OR "fertility rates") AND (declin* OR increas* OR improv* OR reduc*) OR "completed fertility" OR "parity progression" OR "total fertility rate" OR "cohort fertility rate" OR "lifetime fertility") AND (randomized OR randomised OR randomly OR trial OR intervention OR controlled OR control-group OR quasiexperiment OR experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "diff in diff" OR "identification strategy"))

Database: Popline

Search date: 2019-02-20

((((Taxonomy term IDs from the <em class="placeholder">Keyword vocabulary:BIRTH RATE OR Taxonomy term IDs from the <em class="placeholder">Keyword vocabulary:FERTILITY RATE))) AND (((randomized OR randomised OR randomly OR trial OR intervention* OR controlled OR "control group" OR "control groups" OR quasiexperiment OR experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "diff in diff" OR "identification strategy")))) AND ((is_field_document_year_int:[1980 TO 2019])) : 2775

Database: Epistemonikos

Search date: 2019-03-04

Birth rate: 115

Fertility rate: 68

Database: Cochrane Library

Search date: 2019-03-04

#1 Mesh descriptor: [Birth Rate] explode all trees (118)

#2 ((birth or fertilit*) NEXT rate*) or "completed fertility" or "lifetime fertility" or "parity progression" (1324)

#1 or #2 (1324)

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) 1946 to March 04, 2019

Search date: 2019-03-05

1 (((birth-rate* or fertility-rate*) adj5 (declin* or increas* or reduc* or improv*)) or "completed fertility" or "parity progression" or "total fertility rate" or "cohort fertility rate" or "lifetime fertility").ti,ab. (3948)

2 Birth rate/ (8917)

3 1 or 2 (11535)

4 (randomized or randomised or randomly or trial or intervention* or controlled or "control group" or "control groups" or quasiexperiment or experiment* or evaluat* or effect* or "instrumental variables" or "regression discontinuity" or "difference in difference" or "diff in diff" or "identification strategy").ti,ab. (10306498)

5 3 and 4 (4260)

6 animals/ (6358251)

7 humans/ (17574669)

8 6 not (6 and 7) (4519604)

9 5 not 8 (4001)

Appendix 2: Additional information on family policy search

Search dates:

Web of Science: 27.02.2019

Popline: 05.03.2019

Chochrane library, Medline, Epistemonikos, Social services abstracts, Sociological abstracts:
04.03.2019

Search string

TOPIC: (randomized or randomised OR randomly OR trial OR intervention* OR "control group" OR "control groups" OR quasiexperiment or experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "diff in diff" OR "identification strategy")

TOPIC= ("parental leave" OR "fathers quota" OR "daddy quota" OR "maternity leave" OR "paternity leave" OR "cash transfers" OR "cash allowances" OR tax* OR lump-sum OR "lump sum" OR cash-for-care) AND (birth-rate* OR fertility-rate* OR "birth rate" OR "fertility rate" OR "completed fertility" OR "parity progression" OR "total fertility rate" OR "cohort fertility rate" OR "lifetime fertility")

Appendix 3: Additional information on housing search

Search date: 14.03.2019

Search string:

TOPIC: (randomized or randomised OR randomly OR trial OR intervention* OR "control group" OR "control groups" OR quasiexperiment or experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "diff in diff" OR "identification strategy")

AND

("housing market" OR "housing price" OR "housing availability" OR "housing subsidies" OR housing tenure* OR "housing supply" OR housing cost* OR housing expence* OR "housing spending" OR house price* OR "housing affordability" OR housing)

AND

(birth-rate* OR fertility-rate* OR "birth rate" OR "fertility rate" OR "completed fertility" OR "parity progression" OR "total fertility rate" OR "cohort fertility rate" OR "lifetime fertility")

Appendix 4: Additional information on working paper searches

Three searches for working papers were conducted in EconPapers (<https://econpapers.repec.org/>), which searches RePec (www.repec.org). RePec indexes scientific publications from several databases, including online servers for working papers. Our search was limited to working papers only.

1. Basic/open search:

Search date: 18.08.19

Search string: (randomized or randomised OR randomly OR trial OR intervention* OR "control group" OR "control groups" OR quasiexperiment or experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "diff in diff" OR "identification strategy")

AND

(birth-rate* OR fertility-rate* OR "birth rate" OR "fertility rate" OR "completed fertility" OR "parity progression" OR "total fertility rate" OR "cohort fertility rate" OR "lifetime fertility")

216 hits created or revised 2014 or later, 11 unique WPs with original publication date 2014 or later, for which we had not already screened subsequent published versions, were included for full text screening after abstract screening.

2. Family policy search (transfers and parental leave)

Search date: 27.08.19.

Search string:

(randomized or randomised OR randomly OR trial OR intervention* OR "control group" OR "control groups" OR quasiexperiment or *experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "difference-in-difference" OR "diff in diff" OR "identification strategy")

AND

("parental leave" OR "fathers quota" OR "daddy quota" OR "maternity leave" OR "paternity leave" OR "cash transfers" OR "cash allowances" OR tax* OR lump-sum OR "lump sum" OR cash-for-care)

AND

(birth-rate* OR "birth rate" OR "*fertility*" OR "parity progression")

198 hits created or revised 2014 or later. 8 unique WPs with original publication date 2014 or later, for which we had not already screened subsequent published versions, were included for full text screening after abstract screening.

3. Housing search

Search date: 18.08.19

Search string:

(randomized or randomised OR randomly OR trial OR intervention* OR "control group" OR "control groups" OR quasiexperiment or experiment* OR evaluat* OR effect* OR "instrumental variables" OR "regression discontinuity" OR "difference in difference" OR "diff in diff" OR "identification strategy")

AND

(birth-rate* OR fertility-rate* OR "birth rate" OR "fertility rate" OR "completed fertility" OR "parity progression" OR "total fertility rate" OR "cohort fertility rate" OR "lifetime fertility")

AND

("housing market" OR "housing price" OR "housing availability" OR "housing subsidies" OR housing tenure* OR "housing supply" OR housing cost* OR housing expence* OR "housing spending" OR house price* OR "housing affordability" OR housing)

59 hits created or revised 2014 or later. All were already screened in search string number 1.

(Topic specific tails including “health” in combination with other words yielded >600 000 hits and were not sortable. We hence rely on papers on health being captured by the general search, as we found to be the case when we searched for published papers.)