Intersectionality and risk for ischemic heart disease in Sweden: Categorical and anti-categorical approaches

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ABSTRACT

Intersectionality theory can contribute to epidemiology and public health by furthering understanding of power dynamics driving production of health disparities, and increasing knowledge about heterogeneities within, and overlap between, social categories. Drawing on McCall, we relate the first of these potential contributions to categorical intersectionality and the second to anti-categorical intersectionality. Both approaches are used in study of risk of ischemic heart disease (IHD), based on register data on 3.6 million adults residing in Sweden by 2010, followed for three years. Categorical intersectionality is here coupled with between-group differences in average risk calculation, as we use intersectional categorizations while estimating odds ratios through logistic regressions. The anti-categorical approach is operationalized through measurement of discriminatory accuracy (DA), i.e., capacity to accurately categorize individuals with or without a certain outcome, through computation of the area under the curve (AUC). Our results show substantial differences in average risk between intersectional groupings. The DA of social categorizations is found to be low, however, due to outcome variability within and overlap between categories. We argue that measures of DA should be used for proper interpretation of differences in average risk between social (or any other) categories. Tension between average between-group risk and the DA of categorizations, which can be related to categorical and anti-categorical intersectional analyses, should be made explicit and discussed to a larger degree in epidemiology and public health.

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1. Introduction

1.1. Background

At least since the 1990s, researchers have argued that epidemiology needs to give increased attention to social power dynamics and structural forces in the study of cause and distribution of disease on the population level (Krieger, 2011; O’Campo and Dunn, 2012; Susser and Susser, 1996; Wemrell et al., 2016). A growing and now gigantic amount of social epidemiological research looks toward socioeconomic risk factors as determinants of disease (Commission on Social Determinants of Health, 2008) not least regarding cardiovascular disease (Manrique-Garcia et al., 2011), and today it would likely be hard to find an epidemiologist claiming that social factors are not relevant to disease causation (Galea and Link, 2013). However, limitations remain. The majority of social epidemiological studies of health disparities have consisted of identification of inequalities and connections between these and various risk factors, and while such studies have underpinned efforts to address disparities, knowledge about risk factors provides an insufficient basis for effective action toward health equity (O’Campo and Dunn, 2012). Productive analytic attention toward structural dynamics of power needs to be developed further. In Ng and Muntaner’s words (2014), we not only need studies of unequal average distribution of health and disease between groups defined according to race, gender or class, but also analyses of relational mechanisms like sexism and racism.

Study of relational mechanisms and social dynamics is buttressed by social theory. Attendance to theory has however been weak, although long called for, in epidemiology (Krieger, 1994; Ng and Muntaner, 2014; O’Campo and Dunn, 2012). Krieger (2011)
notes that absence of explicit theory does not equate to non-
existence of underlying assumptions or values, but merely means
that these are not made visible, or fully conscious. With reference to
dominance of implicit, rather than explicit, use of theory to inform
epidemiologic research, Krieger notes that this typically rests on
ontologies and epistemologies tied to biomedical and so-called
lifestyle approaches. Central traits in both are individualism and
reductionism, as primary causes of disease at both individual and
population level are typically assumed to be genes or risk factors to
which exposure is largely determined by the individual’s charac-
teristics or behaviors. This is despite the fact that epidemiology has
long distinguished between causes of disease at individual and
population levels (Rose, 1992).

The above applies no less to research on cardiovascular disease.
Studies continually replicate affirmation of the relevance of socio-
economic factors to cardiovascular risk. Shim (2014) argues, how-
ever, that in cardiovascular epidemiology, handling of population
categories such as race/ethnicity, sex/gender and class/socioeco-
nomic position construe these in terms of risk factors on the indi-
vidual level, rather than as functions of dynamics between
individuals or groups (Krieger, 2011; O’Campo and Dunn, 2012). As
public health interventions tend to be formed according to the
same principle, Shim argues that epidemiological knowledge can
contribute to reproduction or even creation of social differences
and inequalities. Along similar lines, Lofferts and O’Campo (2012)
observe that the framing of health inequities as individual-level
issues, resolvable through individual-level intervention or behav-
ioral change, can result in practices of “blaming the victim” rather
than actual amelioration of existing disparities.

Against this background, intersectionality is a concept and a
theory which has been advocated and to a certain degree integrated
by authors including Shim (2014) in studies of population health
and risk during past decades (Girtli Nygren and Olofsson, 2014).
The basic feature of intersectionality theory, which first gained
influence through Crenshaw’s (1989) analysis of positions of
colored women, is conceptualization of categories such as race/
ethnicity, sex/gender, class and sexual orientation not as separate
but as interacting. Power structures are set in the center of analysis;
focus is directed to what social categories and their interactions
disclose about power, and social change is an explicit and over-
arching goal (Hankivsky, 2012). Intersectionality thereby offers a
theoretical framework, write Kapilashrami et al. (2015), which can
help epidemiologists look toward social dynamics rather than so-
cial categories and thus investigate structural motors for in-
equalities rather than individual-level behaviors and risk factors.

Bauer (2014) observes that potential contributions of intersec-
tional analysis to epidemiology include increased specificity in
mappings of health disparities. We agree, while issuing a word of
caution that intersectionality theory is not adequately applied
through mere efforts toward fractioning the population into smaller
taxonomic units through the combination of more than one
major axis of social differentiation. To intersectionality research on
health disparities, the object of interest is how interacting systems
of power drive disease incidence. A second potential contribution
noted by Bauer (2014) is added knowledge about variability within,
and overlaps between, social categories. In the present study, we
integrate intersectional analysis for both these purposes, in inquiry
into risk of ischemic heart disease (IHD) in Sweden. Drawing on
McCall (2005) we relate these two aims to two forms of intersec-
tional analysis.

McCall (2005) famously distinguishes between categorical (or
inter-categorical) and anti-categorical orientations toward inter-
sectionality. Categorical analysis aims to analyze how interlocking
systems of oppression, such as racism and sexism, interact to pro-
duce inequalities between social groups in society, expressed for
example in distribution of income, education and health outcomes.
Here, traditional social categories such as ethnicity and gender may
be used in analyses of patterns of interaction, dominance and
subordination. Anti-categorical inquiry, on the other hand, directs
critique toward categorization itself. Emphasis is placed on the
inherent fluidity and malleability of social categories, as these are
socially contingent constructions rather than mirrorings of fixed
realities. It is here argued that categorization per se can lead to
creation, perpetuation or essentialization of differences and in-
equalities between groups. Power-implicated categorizations of
gender and race, for example, should therefore be carefully used or
deconstructed as a central part of social change.

While intersectionality research has to a large degree been
pursued through use of qualitative methods, McCall (2005) notes
that the categorical perspective is compatible with quantitative
research. Intersectionality has been integrated in quantitative study
explicitly (Hinze et al., 2012; Veenstra, 2011) and more implicitly
through analysis of outcome heterogeneity within and between
social categories (Mulinari et al., 2015a), but in epidemiological
research this is still relatively uncommon. Intersectionality remains
absent, for example, in handbooks on measurement of inequality
and socioeconomic position (Shaw et al., 2007).

Categorical intersectionality can lend itself to integration into
conventional statistical measurement of between-group differ-
ences in average risk, thus potentially fulfilling the capacity to
increase understanding of power dynamics through mappings of
health disparities. Efforts toward increasing knowledge validity
through attendance to outcome variability within and overlap be-
tween social groups (Bauer, 2014) relates more readily to anti-
categorical approaches. We argue that anti-categorical inter-
sectionality, aiming to demonstrate intra-group heterogeneity of
and overlap between social categories regarding individual risk, can
be operationalized in quantitative study through measurement of
discriminatory accuracy (DA).

1.2. Discriminatory accuracy

DA measures the ability of a certain diagnostic tool, marker or
category to correctly discriminate between people with or without
an outcome of interest, often used to evaluate predictive validity
(Page et al., 1995) in epidemiology and other medical sciences
(Merlo, 2014; Pepe et al., 2004). In principle, the tool, biomarker or
category needs to have high DA to be deemed valid for diagnostic or
prognostic assessment of individuals. In the epidemiological study
of risk factors, whether social or biological, inclusion and especially
interpretation of DA has, however, so far been relatively rare
(Merlo, 2014; Merlo and Mulinari, 2015; Merlo and Wagner, 2012).

Epidemiological knowledge on risk typically builds on investi-
gation of difference between average risk computed for different
population groups, categorized along various biological (e.g., blood
pressure), social (e.g., socioeconomic status) or geographical (e.g.,
neighborhood) variables. It is well known that such probabilistic
measures are typically not directly translatable to individuals, as
averages can obscure major differences between people within the
same group, and/or substantial overlaps between people in different
groups (Rose, 1992). Application of average measures on individuals,
which has been called “tyranny of the means” (Tabery, 2011), has long been criticized (Bernard and Greene, 1957; Hogben
and Sim, 1953) not least by epidemiologists favoring “n-of-1”
design (studies made on single individuals) (Guyatt et al., 1986) or
personalized medicine (Lillie et al., 2011). Similar critique has been
voiced in social science (Downs and Rocke, 1979) and biology
(Gould, 1996; Kaplan and Winther, 2013). Still, average risk remains
a major basis for assessment of individual risk in much clinical and
preventive practice, not least regarding cardiovascular disease (Goff

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