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Double Degree Social Demography Master's Thesis

Broadening the Disparity Spectrum: The Health of Sexual and Gender Minorities in 2020s Norway

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Groningen, the Netherlands, 24.07.2024

Word count of main text: 18.022

Abstract

Sexual and gender minorities face persistent health disparities despite efforts from (inter)national authorities to ensure health equality. Previous research links these disparities to minority stress and structural stigma, which entails marginalisation and stigmatisation at multiple societal levels. However, these studies are likely incomplete due to ignoring homogenous experiences and outcomes of various minority identities caused by imperfect data. Moreover, the health penalisation of some identities has likely changed due to increased social acceptance, while new emerging identities are understudied. This thesis uses the 2022 and 2023 Norwegian Quality of Life Survey to overcome previous limitations. This data holds a nationally representative sample of 32,843 cases, of which 3,360 belong to the sexual and gender minority population. Extensive sexual orientations and gender identities are investigated, including trans, non-binary, pansexual, queer, asexual and sexually-fluid. Descriptive findings show distinct socio-demographic characteristics between sexual and gender minorities and majorities, as well as the reporting of lower self-assessed health. After running a series of binary logistic regression analyses, minority identities are predicted to have a lower likelihood of good health compared to cis-genders and heterosexuals. However, the findings are limited in determining the minority-specific effects of health drivers. Future research should focus on the intersectionality of sexual and gender minority identity and social health influences while preserving representative samples and individual sexual orientations and gender identity assessments.

Keywords: LGBTQIA+, Sexual and Gender Minorities, Self-Assessed Health, Health Disparities, Inequality, Norway.

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Abbreviations

In order of appearance in text:

LGBTQIA+	Lesbian, Gay, Bisexual, Trans, Queer or Questioning, Intersex, Asexual, the "+" extends to any sexual or gender minority not represented by the letters
SGM	Sexual and Gender Minorities
SOGI	Sexual Orientation and Gender Identity
LGB	Lesbian, Gay and Bisexual (no other identities)
WHO	World Health Organisation
SAH	Self-Assessed Health
H1 / H1a /H1b etc.	Hypothesis 1 / Hypothesis 1a / Hypothesis 1b etc.
OR	Odds Ratio
BLR	Binary Logistic Regression
VIF	Variance Inflation Factor
CI	Confidence Interval

1. Introduction

1.1. Background

National governments and the European Union strive for health equality for LGBTQIA+ individuals (European Commission, 2020; Regjeringen.no, 2023). However, these persons, also called Sexual and Gender Minorities (SGMs), persistently experience health disparities when compared to their cis-gendered and heterosexual counterparts, both in physical and mental health indicators (Stacey & Wislar, 2023; Valfort, 2017). Scholars have attributed the experienced inequity to minority stress and structural stigma. That is marginalisation and stigmatisation at multiple societal levels (Hatzenbuehler & Link, 2014; Meyer, 2003; Zeeman et al., 2019). The Sexual Orientations and Gender Identities (SOGI) that are less understood and institutionalised in society may be met with discriminatory actions, restricted accommodation of healthcare needs and increased risk of health-damaging behaviour (Connell & Messerschmidt, 2005; Feinstein et al., 2023; Meyer, 2003). This can lead to heterogeneous experiences and disparities at a micro level (Godfrey et al., 2023). At a macro level, their opportunities for better health are also held back due to lacking societal acceptance, for instance, reflected in legislative restrictions like same-sex marriage bans (Hatzenbuehler et al., 2017). By relieving such restrictions, the general well-being of SGMs, whether they are partnered or not, is found to improve and reduce their risk for health-damaging behaviour (Boertien & Vignoli, 2019; Hatzenbuehler et al., 2017).

Several studies indicate that lesbians and gays have worse health than heterosexuals and that bisexuals are substantially worse off (Elliott et al., 2015; Veenstra, 2011; Zeeman et al., 2019). However, investigations regarding the health of other sexual minorities than lesbian, gay and bisexual (LGB) are very much incomplete (Valfort, 2017). While gender minorities are found to have lesser mental health, their inclusion in population-based health studies is scarce, and a consensus about health disparity differences between identities is lacking (Bränström et al., 2024; Crissman et al., 2019; Streed Jr et al., 2018). Moreover, data limitations have made it challenging to investigate the SGM population quantitively, particularly a plurality of SOGI and their distinct outcomes (Cortina & Festy, 2014; Valfort, 2017). This prevents assessing dynamic disparities across identities as their positions in a societal hierarchy might develop (Asada & Hedemann, 2002; Risman, 2018). Moreover, the composition of the SGM population is developing as well. Younger cohorts are more likely to identify with sexuality labels other than the traditional lesbian or gay and see both gender and sexuality as increasingly fluid (Goldberg et al., 2020).

Hence, previous research is likely incomplete in capturing the health inequality of the contemporary SGM population, and opportunities to study disparities of extensive SOGIs in a general population-based context should be grasped. As such, Norway's population provides an interesting case for studying health inequality. The country is highly egalitarian and has a comprehensive healthcare system that seeks to ensure equal opportunities for good health (Sperre Saunes et al., 2020). For this reason, previous population health research has stated that if disparities are found in a progressive and egalitarian country like Norway, they will likely be pervasive across the international context (Olsen et al., 2020). Moreover, the Norwegian government continues to progress with SGM-inclusive policies (Regjeringen.no, 2023). Furthermore, the Norwegian Quality of Life Survey makes the country an ideal setting for studying SGM health disparities. This significant data source is unique in its comprehensive inclusion of SOGIs, like trans, non-binary, pansexual, queer, asexual and sexually-fluid (Grimstad & Støren, 2023; Pettersen & Maria, 2022).

1.2. Statement of the Problem

The latest theoretical and review literature has not identified quantitative health research that separately assesses extensive SOGIs (Bränström et al., 2024; Hatzenbuehler et al., 2024). Previous data sources and methods have introduced severe limitations to include SGM identities appropriately in population-based samples. Here, multiple identities have been clustered and often identified solely based on a partner's gender (i.e. same-sex couples). Consequently, several identities are overlooked, as well as in-group differences (Cortina & Festy, 2014; Valfort, 2017). Hence, the overall health status of certain SOGIs and the gap between them and others remains unclear. Due to the heterogeneous experiences of minority stress and structural stigma (e.g. different amounts of discrimination or legislative restrictions), the allocation and magnitude of disparities are dynamic between SOGIs (Hatzenbuehler & Link, 2014; Meyer, 2003). Thus, the health implications cannot be expected to be identical for the complete SGM population (Asada & Hedemann, 2002; Houweling et al., 2001). Yet, heterogeneous outcomes are ultimately aggregated, and inequalities are displayed in the overall health status (Bowling, 2014). Despite motives and initiatives addressing this overall inequality, the efforts are inadequate as disparity persists (Frost & Meyer, 2023; Hatzenbuehler et al., 2024; Liu & Reczek, 2021). Moreover, the composition and societal position of the SGM population, as well as SOGIs individually, might develop over time (Goldberg et al., 2020; Risman, 2018). Therefore, a bottom-line population-based mapping of health status across contemporary SOGIs is needed.

1.3. Research Objective and Questions

Per the above statement, this thesis will seize the opportunity to address the existing knowledge gap and document health status per SOGI by using the unique traits of the Norwegian Quality of Life Survey and answer the main research question:

To what extent do Norwegian Sexual and Gender minorities experience a health disparity compared to their majority counterparts?

The survey's nationally representative sample and the fact that respondents can self-identify with extensive SOGIs make this possible (Grimstad & Støren, 2023; Pettersen & Maria, 2022). With a sample of 32,843 cases, of which 3,360 belong to the SGM population, unprecedented research can be conducted. The investigation covers heterosexual, lesbian, gay, bisexual, pansexual, queer, asexual and fluid sexual orientations, as well as trans-man, cis-man, trans-woman, cis-woman and non-binary gender identities. The existence and magnitude of disparities will be explored through statistical analysis, stratifying health status between SOGI. Furthermore, socio-demographic personal and environmental characteristics of each SOGI will be described, which may help contextualise differences between SGMs and sexual and gender majorities. This description of the sample population is also valuable since no SGM studies have previously employed the Norwegian Quality of Life Survey. Simultaneously, the effect of SOGI on health can be compared to other demographic and social characteristics found to influence health by previous studies, exploring whether disparities can be expected based on SOGI alone. These efforts will help answer the main research question by addressing the following sub-questions:

1. *What are the personal and environmental characteristics of the SGM population, and are they similar to sexual and gender majorities?*
2. *To what degree are there health status differences across SOGIs?*
3. *When considering other personal and environmental characteristics, how does SOGI predict health status?*

Consequently, there is little focus on the possibly varying moderations of health drivers between identities, unlike other studies (e.g., Godfrey et al., 2023; LeBlanc et al., 2018). This is not to undermine the importance of health moderation. However, existing literature covers this to some extent by focusing on singular identities and employing different methodologies. Besides, while moderation effects might vary between groups, a subsequent health inequality should be acknowledged regardless. Moreover, while the used data is groundbreaking, there are some limitations to what analysis is feasible. Stratifying beyond SOGI, like by health-

moderation effects, becomes difficult. This will be elaborated on in the data and methods section.

2. Preliminary Definitions

To contextualise the problem statement and research objective, some preliminary definitions are provided before proceeding to the theoretical framework. These regard definitions of health inequality, its measurement, and SOGI. To understand an investigation of inequality, it is crucial to grasp the specific inequality at hand and the individuals concerned. Definitions are necessary for this purpose (Harper & Lynch, 2017). Furthermore, they also aid in understanding the theoretical framework as it will leverage these definitions.

2.1. Defining Health Inequality

Essentially, inequality is a shortfall of one group compared to the achievements of another. In terms of shortfalls, one assumes that each group could achieve the status of the "best" group (Sen, 1995). Ergo, health inequalities are shortfalls in health status and the corresponding need for adequate healthcare to overcome this (Harper & Lynch, 2017). To truly understand the severity of health inequality, information about the state of health and the size and distribution of possible disparities is needed. Moreover, the concept and its measures should be appropriate to the multifaceted aspects of shortcomings–whether those relate to physical or mental health or the experience of health-promoting interventions and services. This is most justified in a generic conceptualisation and measurement (Bowling, 2014). Therefore, the WHO definition of *good health* as "a state of complete social, physical and mental well-being, not merely the absence of disease or infirmity" is considered (WHO, 2024). This definition has been criticised for being too broad and unattainable in reality. However, a conventional definition of "the absence of illness or disease" is regarded as limited and negative. Furthermore, the conceptualisation remains challenging, and there is no consensus on it within health research (Bowling, 2017).

Self-assessed health (SAH) is a corresponding generic measurement. The broadness of this measure may provide some constrictions, mainly limiting the ability to distinguish the specific health consequences of minority stress and structural stigma. However, it resembles the definition of health and the possibilities of shortcomings, as health influences and interventions do not have isolated effects either (Bowling, 2014). While there is some subjectivity to the measure, it is one of the most widely used health indicators and appropriately

predicts health outcomes and documents differences between population groups (Jylhä, 2009).

2.2. Explaining Sexual Orientation and Gender Identity

The conceptualisation of SOGI labels should also be explained. Sexual orientation labels are based on sexual identity, attraction and behaviour (Russell et al., 2023; Salomaa & Matsick, 2019). Well-known labels include heterosexual, lesbian, gay (or homosexual) and bisexual, which typically refer to attraction to the opposite, same or both genders. However, additional orientations, like pansexual, queer, asexual and fluid, are becoming more common (Russell et al., 2023). These labels refer to attraction regardless of gender, rejection of heterosexuality, absence of sexual attraction, and dynamic attraction over time, respectively.

Gender identities refer to adopting a label aligned with personal experience of gender. Many derive their label from the sex they were assigned at birth, so-called cis-gendered individuals. Those embracing a different gender than the sex assigned at birth can be referred to as transgender, while non-binary individuals reject the binary labels of man and woman.

3. Theoretical Framework

The theoretical framework of this thesis will confer with prominent gender theory while utilising theory on minority stress and structural stigma to understand SGM health disparities. The gender theories help explain how SOGIs are constructed and encountered in multiple levels of society and why their experiences might differ. To then better understand why SGM individuals experience health inequalities, minority stress theory is explored, as well as the concept of structural stigma. Existing research regarding health and SGMs will also be reviewed alongside previous findings per SOGI when available. Hypotheses are formed along the way. Finally, the theoretical section concludes with some insight into the context of the study's location before the conceptual model is portrayed.

3.1. Gender Theory

While gender could be perceived as traits or social roles, West and Zimmerman (1987) describe it as a continuous activity. Their theory suggests that people *do gender* by performing activities that are deemed gender-appropriate. They state that if one does appropriate gender successfully, one reproduces its construct; if one fails, one is held accountable. The eventual success or failure is assessed through social interactions (West & Zimmerman, 1987). This understanding is well-established in research on gender and sexuality (Lindsey, 2020).

Later, in exploring how one can do gender, Connell's conceptualisation of *hegemonic*

masculinity came forward (Connell, 1995; Risman, 2018). Although prone to adjustments and critique, the traditional idea remains: within gender constructs, there is a plurality and hierarchy (Connell, 1995; Connell & Messerschmidt, 2005). The concept attributes more social power to some masculinities placed more centrally in society. This proposed hierarchy recognises the power of a hegemonic group and the agency and subordination of others. Consequently, by not doing gender in the hegemonic sense, individuals are penalised, and inequality in the hierarchical order is explained (Connell & Messerschmidt, 2005).

Risman (2018) considers *gender as a social structure*, which we might perform and order. After extensively reviewing developed gender theories, she frames gender structures as explaining human action and stratifications in the organisation of society. The structures enable and constrain and can shape individuals, while individuals can also influence the structures. Furthermore, as seen in Figure 1, they span from the individual (how one does gender) to the macro level (how society thinks of gender) of society, with interactions occurring between them. In addition, the levels have cultural (e.g., beliefs and ideologies) and material spheres (e.g., embodiment and legislation). The complex institutionalisation of the structures reproduces hierarchical privilege and oppression. However, she suggests that, like individuals and other social structures, gender structures are not fixated and continuously change.

A simplistic takeaway of these gender theories is as follows: genders are dynamic and created as social constructs at multiple societal levels; gender is performed rather than based on attributes; and there is a reproductive hierarchy between and within the plurality of genders (Connell & Messerschmidt, 2005; Risman, 2018; West & Zimmerman, 1987). To clarify, the theories do not only address gender identities but also sexual orientations. The notion of

Figure 1. The Gender as a Social Structure model (Risman, 2018).
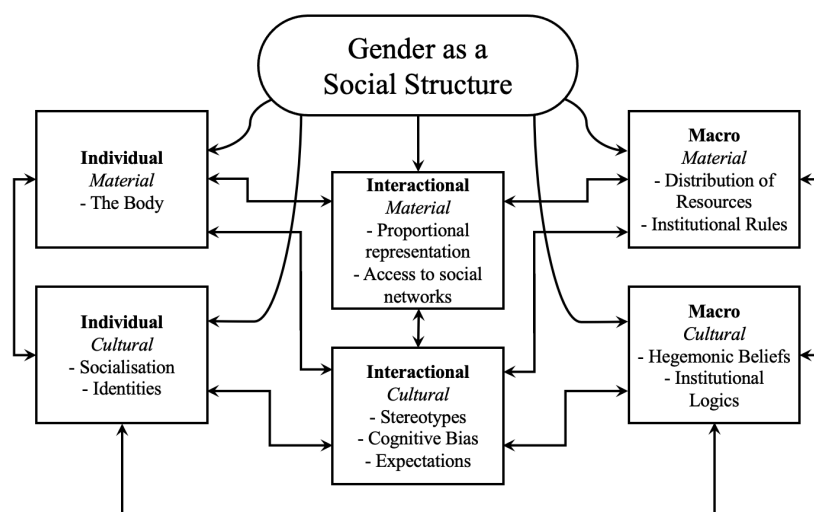
hegemonic masculinity came forward through experiences of homophobia by gay men (Altman, 1993; Connell & Messerschmidt, 2005; Mieli, 1980). Furthermore, scholars have discussed the connection between gender and sexuality:

> Heteronormativity and homophobia have fuelled the mutually reinforcing connection between gender and sexuality such that the logic of heteronormativity—i.e. "to be a good woman is to be a good heterosexual woman"—idealises hetero but also makes gendered identity a virtue, a kind of sexiness (Rutter & Jones, 2018, p. 296).

Both sexual orientations and gender identities other than cis-heterosexual challenge the structures of heteronormativity and become prone to the privilege and oppression of the hierarchy. Thus, regardless of the link between gender and sexuality, the presented issue lies in the oppressive effects of deviating from heteronormativity (Rutter & Jones, 2018).

3.1.1. Acknowledging the Hierarchy when measuring Health Status

Risman pleads to study change and investigate where inequality is relieved but also emerges, documenting hierarchical change (Risman, 2018, pp. 37-38). Socio-demographic research consistently found men to have higher SAH as opposed to women (Dahlgren & Whitehead, 2007). However, this collective assessment only measures the most traditional gender structures. This then goes against Risman's recommendation, as it is not able to identify systematic differences in health experiences (Asada & Hedemann, 2002). When a slight plurality in structures is considered, SGM studies find lesbian and gay persons to have worse health than heterosexual men and women. When advancing with another structure, distinctly lower health ratings are found for bisexuals as well (Zeeman et al., 2019). Risman's argument is then accounted for to some extent. Yet, as the SGM population is currently changing (Goldberg et al., 2020; Russell et al., 2023), developing and emerging structures might introduce further changes to the hierarchy. Where gay men have gained social acceptance and consequently may receive a smaller penalty (McCormack, 2013), less recognised SOGIs prone to misconception (e.g. non-binary individuals, see Darwin, 2020) may enter the lower part of the hierarchy. If one assumes consistent implications from measuring more gender structures, one could expect different SAH for additional structures and less traditional structures to have distinctly lower SAH from cis-heterosexuals.

3.2. Minority Stress and Structural Stigma

A common factor differentiating social groups' health status is the level of stress they are prone to. Stress is generally found to negatively influence a person's health and well-being

(Dohrenwend, 2000; Umberson & Thomeer, 2020). Increased stress usually stems from factors in one's environment or is enacted by changes in living conditions, for example, job loss or partnership separation. While increased stress often burdens mental health, it also influences behaviour to achieve proper physical health, such as diet and physical activity (Dahlgren & Whitehead, 2021; Dohrenwend, 2000). *Minority stress*, on the other hand, is particular stress stemming from structural factors of internalised homophobia, stigma and discrimination in a heterosexist society (Meyer, 2003). The concept was first properly established by Meyer, who argued that these factors led to worsened mental health for gay men. Reminiscent of the gender theories, he explains how a stratified group's social position and conditions expose them to stigmatisation and prejudice. This results in inequality, for instance, in health status. Since its introduction, minority stress has been applied to include gender minorities (Tan et al., 2019). The theory's relevance has been questioned with arguments of declining homophobia in certain parts of society and an increase in social repercussions for homophobic actions (McCormack, 2013). However, a recent review has confirmed that distinct stress is still experienced by SGMs, as well as the relevance of the theory and its application, also to influence health in a more general sense (not limited to mental health only; Frost & Meyer, 2023).

The *minority stress model* (see Figure 2) showcases particular processes for health outcomes for minorities, which can be categorised as proximal and distal stressors (Meyer, 2003). Proximal stressors are embedded in internal personal processes, where individuals are socialised to evaluate their own characteristics negatively. These include expectations of stigma, concealment of identities, and internalised homophobia (individual-level gender structures; Frost & Meyer, 2023). Distal stressors cover prejudiced events in the surrounding

Figure 2. The Minority Stress model (Meyer, 2003).
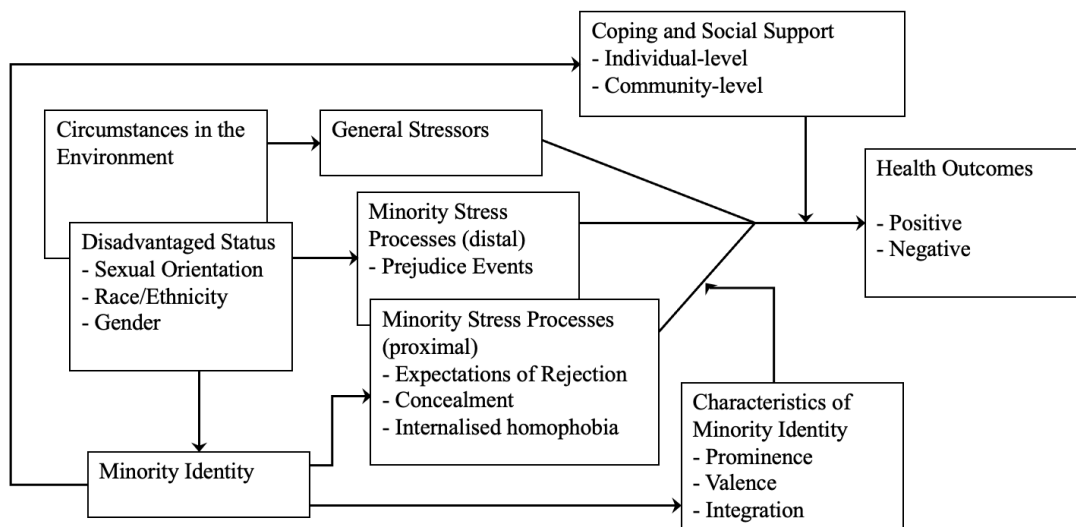
environment and implications of what has been conceptualised as a *structural stigma*. It is defined as "Societal-level conditions, cultural norms, and institutional policies that constrain the opportunities, resources and well-being of the stigmatised" (macro-level gender structures; Hatzenbuehler & Link, 2014, p. 2). Structural stigma also emphasises the physical health implications. It has been associated with increasing the risk of alcohol and drug abuse among SGMs, as well as the ability to prevent and treat diseases more prevalent among this population group, like HIV/AIDS and other sexually transmitted infections (Hatzenbuehler et al., 2024).

3.2.1. SGM Processes to Health Outcomes

Kaplan and Baron-Epel (2003) explain that among one's internal processes (where proximal stressors are hosted), one's health outcomes are also evaluated. These evaluations are based on judgments about others with similar characteristics. The gravity of this judgment may vary by age and underlying health status. In general, older people are expected to rate their health lower than younger people (Jylhä, 2009; Kaplan & Baron-Epel, 2003), and the presence of chronic diseases or disabilities also declines one's SAH (Bailis et al., 2003). Increased proximal stressors might then similarly diminish the appraisal of SAH for SGMs. However, this can be lifted with subjective-view interventions (Meyer, 2003). These interventions attempt to adapt the appraisal to stress or the gravity of internal judgments (Kaplan & Baron-Epel, 2003; Meyer, 2003). Be that as it may, subjective interventions are cautioned to put focus on the victim while failing to recognise and intervene with the underlying issue, which is structural stigma (Kitzinger, 1997).

On the other hand, engaging with structural stigma and lifting distal stressors are possible with objective-view interventions covering sociocultural factors. These interventions affect the environmental causes of stress and implement adaptations to reduce the present stress risks (Hatzenbuehler & Link, 2014; Meyer, 2003). Specific instances could be legislative recognition or protective policies, like introducing the ability to change gender on identity documents. This increases the probability of reporting good health for gender minorities (Nelson et al., 2023).

The minority stress model may portray the emergence of further health implications when considering the gender as a social structure model. Social reactions to doing gender are found in the interactional level of the cultural spheres. They are shaped by prejudice, such as pre-made expectations and assumptions, relying on cultural knowledge in the environment (Risman, 2018). When someone deviates from prejudice, the reactions hereon can translate to inequality. For instance, a discriminatory response can negatively influence health outcomes

as a prejudice event occurs (distal stressor; Meyer, 2003). One may expect lower health outcomes for SOGIs when cultural knowledge about them is lacking in their environment. Moreover, the lack of knowledge might weaken their social contact and support networks (Needham & Austin, 2010). Social contact and support are widely recognised as critical factors influencing health outcomes. Increased relationship quality and quantity are associated with higher health ratings (Seeman, 1996; Umberson & Thomeer, 2020). Hence, when friends and family also lack the necessary knowledge about SOGIs, SGMs likely face lower health ratings. This is worrisome as a lack of acceptance may temper relationships for SGMs and diminish (parental) support, possibly manifesting early during their youth, for instance, due to bullying (Valfort, 2017). Moreover, disclosing one's SOGI ("coming out") can lead to further estranged parental relationships (Needham & Austin, 2010).

Due to structural stigma, health inequality may also arise through more diffuse environmental pathways. An example would be same-sex marriage legislation, which represents a lack of interaction between the individual and macro levels of gender structures' material sphere (Hatzenbuehler & Link, 2014; Meyer, 2003; Risman, 2018). In the minority stress model, this could enable distal stressors, change environmental circumstances and alter the characteristics of the minority identity, such as integration. Correspondingly, legislative recognition of same-sex marriage improves the well-being of SGMs and their health-promoting behaviour (Boertien & Vignoli, 2019; Hatzenbuehler et al., 2017). Therefore, individuals whose gender structures are less embedded at higher societal levels may be prone to higher degrees of structural stigma and, consequently, health disparities based on their SOGIs. Recent findings further underline this expectation. Persons identifying as both sexual and gender minorities, and thus holding complex and likely less embedded gender structures, experience the most substantial health disparity (Stacey & Wislar, 2023).

However, structural stigma depends not only on legislation and policies. Regional differences are particularly emphasised by varying social conditions and norms, and SGM health implications are likely to fluctuate between regions (Hatzenbuehler et al., 2017). This is also consistent with general health research. Although, geographical differences are often associated with varying socio-economic distributions and the availability of healthcare services and other amenities (Pearce & Dorling, 2006). Those with increased access to amenities and services are expected to have better health (Salmela, 1993).

Ultimately, while the SAH of cis-heterosexuals might also be lower due to, for instance, age, weakened relationships and limited access to healthcare services, they likely benefit from

fitting into the hegemonic norms. On the contrary, it is evident that the minority stress and structural stigma derived from the social hierarchy lead to less favourable outcomes for SGMs. Even as the gravity of these effects could be dynamic across minority identities, they are pervasive for the whole SGM population. Hence, the first general hypothesis is formed: *(H1) Heterosexuals report better SAH than all sexual minorities, and Cis-gendered individuals report better SAH than all gender minorities.*

3.3. Research on Health and Sexual and Gender Minorities

In recent years, health research regarding SGMs has grown substantially, but with a disproportionate amount concerning sexual minorities and limited to LGB identities and particularly mental health symptoms (Zeeman et al., 2019). Nevertheless, the findings on more focused indicators still relate to overall health and should be considered (Bowling, 2014). Furthermore, a restriction to SAH research would greatly limit the available literature on several SOGIs. Research regarding SGMs generally struggles with data limitations in including several identities (Cortina & Festy, 2014; Valfort, 2017). Nevertheless, previous research has also provided helpful insight into SGM experiences and well-established population health factors (Assari & Bazargan, 2019; Zeeman et al., 2019). While SGM identities are the main focus of this thesis, this is not to say that they are the only health risk factors, nor vulnerable minorities. However, while holding several disadvantaged statuses could have additive effects on health, it is challenging to attribute the effects separately (Russell & McCurdy, 2023). To better understand the ultimate role of SOGI in determining health, it should be considered among other characteristics known to explain social group health differences. Social hierarchy, minority stress and structural stigma seem to affect the process towards health outcomes for SGMs. However, the starting point of every process, as also depicted in the Minority Stress model itself, is the circumstances in one's environment and the characteristics of one's disadvantaged status (Meyer, 2003). In a universal sense, these are *personal* and *environmental* socio-demographic characteristics (Dahlgren & Whitehead, 2007). SOGI is then considered a personal characteristic. The general assumption is that these grouped characteristics[1] do, in fact, predict health outcomes. This leads to the second general hypothesis*: (H2) Socio-*

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[1] The characteristics considered are well-established in portraying social group differences in health outcomes (Dahlgren & Whitehead, 2021). They are all discussed in the theoretical framework. Personal characteristics include age, gender, partnership status, minority status, employment status, education level, income and objective health conditions (Adler & Ostrove, 1999; Albert-Ballestar & García-Altés, 2021; Bailis et al., 2003). Environmental characteristics are geographical differences and social contact and support (Pearce & Dorling, 2006; Seeman, 1996).

demographic personal and environmental characteristics influence SAH.

3.3.1. Lesbian, Gay and Bisexual

As the most studied SGM identities, it is well established that LGB persons face worse health outcomes compared to heterosexuals (Zeeman et al., 2019). Additionally, in separate measures, LGBs have been found to have a higher risk of poor mental health and health-damaging behaviour, as well as scoring significantly lower than heterosexuals on physical health indicators (Fredriksen-Goldsen et al., 2013). Compared to lesbians and homosexuals, bisexual people are more likely to score low on SAH (Elliott et al., 2015; Veenstra, 2011). Recently, Liu and Reczek (2021) found that these findings hold across cohorts, and the disparities of LGB individuals only increase, most significantly for bisexuals.

Looking at determinants of health, it is challenging to pinpoint if the effects are different for LGBs than for heterosexuals. Socio-economically, those being employed and with higher education and income are expected to have better health (Dahlgren & Whitehead, 2007). This could be favourable as some suggest that particularly gay and lesbian individuals are likely to have relatively higher education compared to their heterosexual counterparts (Badgett et al., 2021). However, Assari and Bazargan (2019) find that the return on health by education for LGB is disproportionate. Moreover, SGM individuals also experience income penalties and are often discriminated against in the hiring process (Valfort, 2017).

As mentioned earlier, the health benefit of social relationships could be tempered for SGMs. However, a German study has suggested that adult gays and lesbians do not hold extensively different parental relationships than heterosexuals. Instead, the parental relationships are only slightly less emotional (Hank & Salzburger, 2015). However, this does not take away from the risk of social scrutiny due to a persistent lack of acceptance, and the study did not consider those without a parental relationship (Hank & Salzburger, 2015; Valfort, 2017).

3.3.2. Other Sexual Minority Identities

Robust findings of health outcomes of other sexual minority identities are sparse. These identities have hardly been specified in quantitative data (Russell et al., 2023). Some might even question the authenticity of their differences. For instance, in a US study, bisexual, queer and pansexual women were reported to have similar experiences of minority stress and reported mental health. However, the quality of their relationships was different, and they faced unique challenges regarding their respective identities (Godfrey et al., 2023). Moreover, another study

found pansexual individuals exhibited more mental distress symptoms than bisexuals and were more likely to be younger and a gender minority as well (Greaves et al., 2019). Feinstein et al. (2023) also reported pansexuals to have higher disclosure of mental health diseases and also for queer identities. While the findings lost statistical significance after controlling for demographic factors, they did find queer-identifying individuals to experience higher rates of discrimination compared to other sexual orientations.

Interestingly, one population-based study in New Zealand has been able to investigate Asexual identities. The findings did not associate any disparity in health with the asexual identity. Still, they did find asexual individuals less likely to be cis-gendered and more likely to be women without a romantic relationship (Greaves et al., 2017). The lack of partnership might increase the odds of lower health ratings for asexuals, as having a partner is associated with increased health (Dahlgren & Whitehead, 2007).

Lesbian, Gay and Bisexual identities are more extensively studied, and their findings are likely reproduced. As in that, they will have worse health than heterosexuals. However, the difference between heterosexuals, lesbians and gays might have decreased as they have likely gained societal acceptance/cultural knowledge. Yet, a greater disparity is still expected of bisexuals, and it could be difficult to distinguish the levels of minority stress experienced by sexual minorities other than lesbians and gays. By that, like bisexuals, it could be higher, and their reported health may be worse. Even though they might have unique challenges, these could be linked to their remaining socio-demographic characteristics. The study on Asexuals portrays notions of heightened risk factors for these individuals, suggesting lower odds for good SAH. This leads to the first sexual-minority-specific hypothesis: *(H1a) Among sexual minorities, lesbians and gays report the highest SAH, followed by bisexual, pansexual, queer and sexually fluid individuals. Asexual individuals report the lowest SAH.*

Furthermore, it seems that the stigma-induced disparities are partially explained by the consequential personal and environmental characteristics that sexual minorities find themselves in. Hence, these characteristics will likely retain gravity in predicting SAH, and the second sexual-minority-specific hypothesis becomes: *(H2a) The negative effect of having a minority sexual orientation on SAH is weaker than the effects of the remaining personal and environmental characteristics.*

3.3.3. Gender Minorities

Compared to sexual minority health research, gender minority health research is less mature and has dominantly been investigated in US-based studies. However, the topic has

gained traction, and some studies have provided quantitative insights into their SAH (Bränström et al., 2024). Trans persons have higher odds of poor SAH when compared to cis-gendered counterparts, with trans women having the highest odds, as well as feeble mental health (Goldsen et al., 2022). However, the ingroup difference might be uncertain as other studies based solely on trans samples conclude with the most significant disparity for trans men and others for gender non-conforming/non-binary individuals when included (Crissman et al., 2019; Streed Jr et al., 2018). In general, gender minorities are prone to specific kinds of health stressors and risks. For instance, the internal conflict with their gender assigned at birth is repeatedly characterised by tremendous psychological distress (Bränström et al., 2024).

The marginalisation of gender diversity is also detectable in other health determinants. As society develops, younger generations might transition earlier due to positive perceptions of social acceptance. However, this does not remove the persistent disparity in the socio-economic status, like income and education, of transgenders compared to cis-genders (Kolk et al., 2023). Moreover, trans-women experience significant earning penalties post-transition. Interestingly, an existent penalty does not change for trans-men post-transition (Geijtenbeek & Plug, 2018). This may suggest accountability differences for breaking doings of gender between the identities.

Furthermore, stigma is present in multiple pathways regarding trans social relationships and support. They encounter hardship when coming out, transitioning and seeking social support. This hardship can also be felt by their close ones and those who seek to lend social support to trans persons (Lewis et al., 2023). It seems that the experiences of gender-diverse individuals are substantially complex, and scenarios without stigma are extremely rare. Therefore, the first gender-minority-specific hypothesis states: *(H1b) Among gender minorities, the SAH decreases from trans-men to trans-women, while non-binary individuals report the worst SAH.* Moreover, similar to sexual minorities, their penalties are also felt in other socio-demographic characteristics that likely explain health disparities. Hence, the coinciding second gender-minority-specific hypothesis is as follows: *(H2b) The negative effect of having a minority gender identity on SAH is weaker than the effects of other personal and environmental characteristics.*

3.4. The Norwegian Context

Despite its relatively small size and low population density, Norway is a frontrunner in egalitarianism with high gender equality, equal educative opportunities and an extensive socio-democratic welfare state (Sperre Saunes et al., 2020). The premise of the health system is equal

access for equal needs, and the Norwegian population is generally in good health (Sperre Saunes et al., 2020; World Health Organisation, 2022). However, there are increasing socioeconomic-related health disparities. Olsen et al. (2020) find that this health gradient is most visual through the difference in income. Moreover, regional differences in health indicators are also present. These differences are associated with the availability of health services and providers that vary depending on the regional population density (Salmela, 1993).

Regarding SGM topics, Norway was one of the first countries to legalise same-sex marriage in 2008. Moreover, ILGA-Europe, a leading umbrella organisation for advocates of LGBTQIA+ rights, persistently ranks Norway high on its acclaimed human rights index for LGBTQIA+ persons (Rainbow Europe, 2023). The public and political discourse have recently focused on the banning of conversion therapy, debates around homosexual blood donations and the creation of an official third administrative gender. However, this progressive development is also tempered by the rising political right-wing movement and events like the fatal shooting during the Oslo Pride in 2022 (NRK, 2022). Moreover, Røthing and Svendsen (2010) describe contradictions between progressive values and perceived realities among Norwegian youth. Although Norway has long led a movement of socially accepting attitudes towards SGMs, there was a lack of seeing anything other than cis-heterosexuality as a viable reality among students. This was also reflected in their teaching material.

3.5. Conceptual model

The theoretical framework has led to the conceptual model used for this thesis, which is depicted in Figure 3. It includes the hierarchy of gender structures (Connell & Messerschmidt, 2005; Risman, 2018; West & Zimmerman, 1987), structural stigma (Hatzenbuehler & Link, 2014) and elements of the minority stress model (Meyer, 2003). The eventual operationalised concepts will be further elaborated in the data and methods section (Chapter 4). However, the model indicates non-operationalised concepts with soft-edged

Figure 3. Conceptual model.
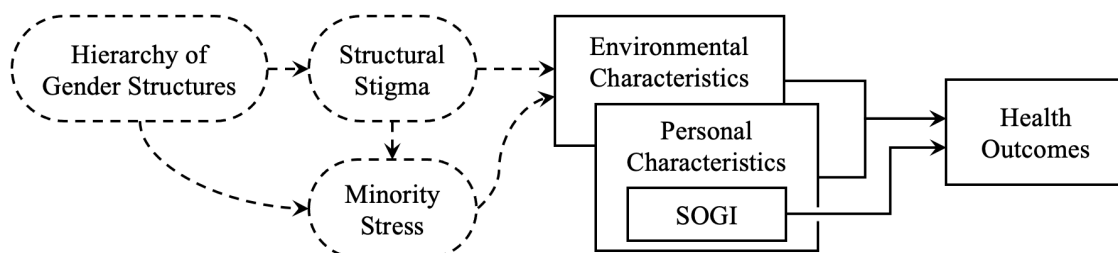
Note: Dashed and round-edged concepts are not operationalised for analysis.

dashed boxes. Including these concepts in the model is justified as they depict sources of the expected gradient in health outcomes. Hence, their inclusion ensures recognition of the underlying structural issue, as scholars have advocated (Hatzenbuehler & Link, 2014; Kitzinger, 1997). Still, as discussed, the translation from these sources to health inequalities may arise through diffuse pathways and at different scales, making them inherently difficult to measure.

Nevertheless, the model effectively demonstrates how the hierarchy of gender structures serves as a societal bedrock for the emergence of structural stigma and minority stress. Structural stigma can then shape one's environmental characteristics while also affecting these by compounding minority stress. The personal characteristics intersect with environmental circumstances, as they can mutually influence each other. Environmental characteristics encompass social contact and support and geographical differences. The personal characteristics include demographic components, underlying health conditions and socioeconomic traits. Furthermore, SOGI is particularly highlighted as this alone might portray health differences (relating to H1), but performs alongside the remaining characteristics. The model shows that these personal and environmental characteristics determine health outcomes (relating to H2).

4. Data and Method

To answer the present research question and document the health disparities of SGMs, this thesis took a quantitative approach. Details hereof are elaborated in the following sections. First, the plan of analysis is outlined, presenting the considerations taken regarding answering each research sub-question and the necessary tools to be employed. These tools are discussed afterwards, consisting of the data, operationalisation of concepts and the statistical procedure.

4.1. Plan for Analysis

The fundamental consideration regarded identifying data that could sufficiently address the main research question and sub-questions, without stumbling over the same obstacles as previous studies. The Norwegian Quality of Life Survey was deemed as such, starting with the cross-section of 2022. Earlier rounds were not considered due to the necessary options for SOGI self-identification first being introduced in 2022 (Pettersen & Maria, 2022). To strengthen the robustness of the results, the 2022 data was then merged with that of the following 2023 round, approximately doubling the number of SGM cases (sample details are

found in Table 1 and 2). While this could imply a temporal effect, the merger was valuable as some identities were sparsely represented, incriminating the ability to produce accurate estimates (Agresti, 2019). Be that as it may, utilising these recent rounds also demonstrates data strength. Since it was newly collected, the sample is contemporary, supporting the research objective. To answer the research sub-questions, the data was utilised for descriptive and predictive statistical analysis.

The descriptive analysis portrays the distribution of the study sample across the later operationalised measures. By describing the socio-demographic personal and environmental characteristics of each SOGI, eventual health differences between SGMs and sexual and gender majorities could be contextualised. Conclusions hereof answer the first research sub-question. As is later elaborated on in the statistical procedure, a set of logistic regression analyses were then conducted for the predictive analysis. They explore what health outcomes each SOGI could expect and further estimate the magnitude of health differences through three model configurations.

The baseline configuration (Model 1) measures health outcomes solely by SOGI. It aspires to portray a gradient regardless of other health determinants, illustrating the position of each SOGI in a health hierarchy. Results from this model help answer the second research sub-question. The following specifications include the remaining health-influencing socio-demographic characteristics. First, the personal characteristics (Model 2), before the environmental characteristics, are also included (Model 3). These models account for inevitable differences within population groups despite the hierarchy the first model provides. Thereof, a clearer picture can be derived regarding whether disparities are due to SOGI alone or related to constraints in other societal areas, answering the final sub-question.

The models are built for sexual orientation and gender identity separately, investigating their health outcomes individually. Although SGMs are often compared, also in this thesis, gender and sexuality are represent two separate characteristics of an individual and thus measured and investigated separately. Furthermore, while their marginalisation might be explained similarly, they sketch health gradients across different categories. Moreover, as mentioned in the problem statement, covariates are mainly controlled for and not tested for moderation through interactions. The main reason is the research objective and the available number of cases per SOGI. The strength of the Norwegian Quality of Life survey is its extensive inclusion of SOGI. Nevertheless, non-cis-heterosexuals still only account for 6% of the sample cases. Therefore, increasing the number of parameters becomes more difficult and

parsimonious model specifications are preferred (Agresti, 2018). However, by introducing covariates as controls in the models, the eventual health effect on SGMs can be isolated and identified to a greater extent (Mehmetoglu & Jakobsen, 2022). Yet, considering that Norwegian health disparities are most notable through income differences and the data having a greater representation of sexual minorities than gender minorities, one additional model (4) is constructed for sexual orientations only (Olsen et al., 2020). Here, an interaction between sexual orientation and income is introduced to gain further insights into the penalisation of SGMs and the final research sub-question.

4.2. Data

The Norwegian Quality of Life Survey was instructed by the Norwegian Health Directory and aimed to understand better the disparities in quality of life among diverse population groups. Statistics Norway conducts this cross-sectional survey, and the dataset is fully anonymised (Grimstad & Støren, 2023; Pettersen & Maria, 2022). Therefore, this study did not require consent or ethical approval from participants. The data is provided by the Norwegian Agency for Shared Services in Education and Research, and their guidelines for data protection have been honoured[2].

The specific survey rounds employed are from 2022 and 2023. The 2022 round was collected between March 7th and April 6th, and the 2023 round between March 6th and March 12th. A nationally representative sample[3] of 40,000 people aged 18 or older living in Norway was randomly selected from the population registry for each round, while the survey was collected through web forms. In addition to the survey questions, the data was complemented with information from the population register. The survey achieved a final response rate of 38% in 2022 and 45% in 2023, with a final sample size of 15,148 and 18,000, respectively (merged total $N = 33,148$). Modest representation deficits exist in both rounds. Individuals between the ages of 45 and 66 and those with a university or college education are slightly overrepresented compared to other groups. Meanwhile, those between the ages of 25 and 44 (18 and 44 for the 2023 round), those over 80, and persons with primary education are slightly underrepresented.

Weights are provided in the dataset to adjust for selective inclusion and maintain appropriate representation in analysis. However, this can also represent an implication of

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[2] The data protection guidelines can be found at https://sikt.no/en/data-management-plan. For more details regarding data management, see Appendix A.
[3] The sampling frame concerned age, sex and county of residence, based on Statistics Norway's population register. This is statistically equivalent to the official Norwegian population register (Grimstad & Støren, 2023; Pettersen & Maria, 2022)

utilising the survey for the present study. The weights are calculated with the targeted general Norwegian population in mind, and calculations are based on age, sex, educational attainment, country of origin and geographical region (Grimstad & Støren, 2023; Pettersen & Maria, 2022). Consequently, the representation of SGMs is entirely random, and it is questionable if the weights appropriately adjust for the representation of SOGI, as likewise argued in previous studies (e.g., Meyer et al., 2020). Hence, predictive results are calculated with and without weights, and notable differences are reported.

4.2.1. Study Population

The analysis sample is slightly smaller than the total survey sample. Cases missing necessary information in the primary measures were dropped as no predictions can be made hereon. This concerns the health outcome variable, with only 61 cases missing information. The other regards the SOGI of respondents. When this information is missing or unspecified, it contradicts the research objective of identifying the health status of each SOGI. While an "other" response option is available for SOGI, it holds reliability issues. It is found that those choosing "other" are very likely to be cis-heterosexuals who either do not understand the question or are uncomfortable with reporting SOGI (Kühne et al., 2019). This option holds 23 cases for sexual orientation and 20 for gender identity. Another 4.8% of the total cases were missing information for sexual orientation (*N=1,584*) and 0.7% for gender identity (*N=224*). To ensure that missing information on gender identity did not interfere with the results calculated for sexual orientation and vice versa, two separate samples were constructed. Resulting in a final sample of 31,543 cases for sexual orientations and 32,904 for gender identities. This approach upholds the maximum number of cases for each analysis while guaranteeing consistency between the descriptive and predictive findings.

4.3. Operationalisation

Several measures operationalise the elements of the conceptual model. The operationalisation of health outcomes and SOGI are presented first as they represent the outcome and main predictor variable. Several covariates then operationalise the remaining personal and environmental characteristics. If the measures are not reported by respondents in the survey, it is indicated that they are derived from the population register. The values and further specifications of the variables can be found in Appendix B.

4.3.1. Health Outcomes

As has already been described in the preliminary definitions of this thesis, SAH is an appropriate measure to capture the shortcomings in health outcomes and differences between population groups (Bowling, 2014; Jylhä, 2009). While the data solely includes self-assessed variables regarding health, two questions regard physical and mental health separately. However, they are deemed unfit for the research objective, as these measure satisfaction with one's health status rather than and regardless of the status itself. Therefore, following Bowling (2014), the inaugural health question, "How would you rate your overall health?" is preferred for the analysis, assuming it captures the overall assessment and the sum of other indicators. This question format is also what is generally referred to as SAH in research and what has been proven to predict the health status of population groups accurately (Jylhä, 2009). Moreover, this employed variable (*SAH*) has answer options on a five-step scale, from (1) "very good" to (5) "very poor," per the WHO guidelines for survey health assessment (WHO & Statistics Netherlands, 1996).

4.3.2. Sexual Orientation and Gender Identity

Respondents may self-identify with their *sexual orientation* and are operationalised as such. The provided options are heterosexual, lesbian, gay, bisexual, pansexual, queer, asexual and fluid. Moreover, the choice of 'other sexual orientation' is also available, and if chosen, followed by an open question where the respondent may specify their preferred option. However, as mentioned, these cases were deleted. Nevertheless, this is a unique trait of the dataset as most previous SGM studies have pooled various SOGIs together or based their identification on the gender of their partner. Such a method increases the chances of incorrect and underreporting (Cortina & Festy, 2014; Valfort, 2017).

For *gender identities*, the self-identifying options include man, woman, non-binary, and 'other gender identity' (with similar open specifications as for sexual orientation). Additionally, two more variables concern gender: gender, as specified in the population register, and a question asking whether the respondent has ever successfully changed legal gender. Based on these three variables, a distinction between cis-gendered, non-binary and trans individuals can be made. A respondent is considered trans if they report having ever changed legal gender or if there is a mismatch between the self-reported gender and population registered gender. This results in a constructed variable with five categories: trans-man, cis-man, trans-woman, cis-woman and non-binary.

4.3.3. Personal Characteristics

Personal characteristics are operationalised through demographic and socioeconomic factors and health impairment. Firstly, *Age* is measured continuously and provided in the data by birth year in the population register. Besides controlling for the effect of age on health outcomes, this also controls for differences in comparative references in the SAH, as described Kaplan and Baron-Epel (2003).

Several characteristics are operationalised through binary variables. *Foreign-born* individuals are also identified in a provided variable to measure minority status other than SGM. Since the effects of multiple disadvantaged statuses on health are challenging to separate, this measure is included to further isolate the outcomes by SGM status (Russell & McCurdy, 2023). Furthermore, the country of origin is the sole identifier of other minorities in the data. It is derived from the population register, which signifies migrants and their country of origin. An *objective health* indicator is included to control for severe impairments that might otherwise decline SAH (Bailis et al., 2003). The provided variable indicates those having long-lasting health issues, which cause notable limitations in conducting daily activities. The last binary variable regards the respondents' *employment status* and is measured in a constructed variable. Respondents are considered employed if they are in paid labour, studying or serving in the military, as identified in separate measures. This is per the general Norwegian conceptualisation of those regarded as employed (Stokke et al., 2007).

Socioeconomic characteristics are otherwise measured in the categorical *income* and *education* variables and are fully derived from the population register. The data provides categories of highest to lowest income quarters. While Olsen et al. (2020) find that Norwegian gradients in health can be best explained through income, education is also included as it remains a well-established health determinant (Dahlgren & Whitehead, 2021). The provided categories relate to the highest education attained and are "Higher education (more than four years)", "Higher education (up to four years), "Secondary", "Primary", and "None or not specified".

Partnership status is measured in a constructed categorical variable. As separation/divorce and loss of a partner could be a health stressor, respondents who have experienced this are separated from the remaining unpartnered (Dohrenwend, 2000). Information from the population register indicates the respondents' civil status. Distinctions between registered partnership and marriage are removed. The "Registered partnership" category subsequently contains respondents who are married or in a registered partnership.

Another category contains the separated and divorced, and another widowed or remaining partners. Those who indicated in the survey that they are partnered and cohabitating or partnered and not cohabitating (not married or in a registered partnership) make up the "Partnered" category. The final partnership status category contains unpartnered respondents.

4.3.4. Environmental Characteristics

Environmental characteristics are operationalised in three aspects: geographical differences, social contact and support and discrimination. While geographical health differences can be expected for people in general due to the presence of services and amenities, SGMs might also expect this based on present social attitudes (Hatzenbuehler et al., 2017; Salmela, 1993). However, differences will be captured through a single measure as the data provides no option for measuring social attitudes in the environment. The regional differences are thus measured through *centrality*. Due to Norway's unique characteristics and population spread, Statistics Norway provides this measure for analysing geographical differences (Høydahl, 2020). The main determinants are the number of workplaces and service amenities within a 90-minute travel radius of living districts. Each municipality is given an average score. The variable contains three categories: low, medium and high centrality.

The second variable regards the *number of close relationships* and captures the level of social contact and support. This is emphasised as the proper way of measuring the availability of someone to offer support (Bowling, 2014). Respondents specify the number of people they can rely on in case of severe personal struggles. The provided categories include "6 or more," "3 to 5," "1 to 2," and "none." The final variable operationalises a prejudice even that might occur in the environment, namely *discrimination*. Previous studies on minority stress have included specific measurements of distal and proximal stressors (e.g., Frost et al., 2015). However, tailored surveys are employed in such instances. The employed dataset uses a standardised survey, with discrimination as the only appropriate option. Reported discrimination based on either gender or sexual orientation is included. Whether this variable represents sexuality or gender-based discrimination depends on the corresponding sample to be analysed.

4.4. Statistical Procedure

The analyses were conducted using the statistical software STATA version 17. The sample descriptions are found in Tables 1 and 2. Moreover, a Pearson chi-squared statistic was calculated between SAH and SOGI to identify statistical (in)dependence between the two

Table 1. Distribution of sexual orientations across operationalised measures.

Measure	Hetero. %/Median	Les./Gay %/Median	Bisex. %/Median	Pansex. %/Median	Queer %/Median	Asex. %/Median	Fluid %/Median	Total %/Median
SAH								
Very good	17.91	16.74	9.10	8.78	13.16	4.29	13.16	17.60
Good	50.18	47.80	38.39	36.49	31.58	32.86	43.86	49.73
Neither nor	20.64	21.15	27.16	24.32	23.68	25.71	27.19	20.84
Bad	9.72	11.67	20.49	24.32	28.95	32.86	13.16	10.15
Very Bad	1.56	2.64	4.86	6.08	2.63	4.29	2.63	1.68
Age	50	41	29	29	28.5	36.5	34.5	49
Gender								
Man	48.75	61.78	30.48	28.57	22.86	37.68	35.78	48.35
Woman	51.18	35.78	67.50	57.86	57.14	49.28	58.72	51.36
Other	0.06	2.44	2.02	13.57	20.00	13.04	5.50	0.29
Foreign born								
No	88.69	83.92	87.41	85.14	88.16	81.43	77.19	88.52
Yes	11.31	16.08	12.59	14.86	11.84	18.57	22.81	11.48
Obj. Health								
Not reported	73.26	71.18	60.64	52.05	56.58	52.94	66.07	72.76
Reported	26.74	28.82	39.36	47.95	43.42	47.06	33.93	27.24
Employ. status								
Employed	90.22	87.89	81.94	73.65	75.00	64.79	85.96	89.83
Unemployed	9.78	12.11	18.06	26.35	25.00	35.21	14.04	10.17
Income quarter								
Highest	33.61	26.65	18.21	12.84	17.11	11.27	23.68	32.96
Third	27.58	29.07	21.09	18.24	11.84	22.54	20.18	27.35
Second	21.46	21.37	21.70	26.35	32.89	28.17	20.18	21.53
Lowest	17.35	22.91	39.00	42.57	38.16	38.03	35.96	18.16
Education								
Higher (>4 yrs)	14.85	18.94	9.86	10.14	15.79	11.43	14.91	14.78
Higher (1-4 yrs)	32.41	31.06	28.38	29.73	26.32	37.14	28.07	32.27
Secondary	38.35	31.72	35.66	33.11	34.21	31.43	33.33	38.13
Primary	12.37	13.66	22.00	24.32	19.74	18.57	19.30	12.71
None (specified)	2.02	4.63	4.10	2.70	3.95	1.43	4.39	2.12
Partner. status								
Reg. partner	46.99	23.88	16.39	14.19	7.89	11.43	25.44	45.61
Partnered	28.83	32.37	41.73	48.65	38.16	14.29	33.33	29.25
Separated	5.99	3.79	3.95	6.08	7.89	12.86	9.65	5.95
Remain. part.	2.42	0.89	0.76	1.35	0.00	1.43	0.00	2.34
Unpartnered	15.78	39.06	37.18	29.73	46.05	60.00	31.58	16.85
Centrality								
High	47.06	62.91	53.73	54.73	64.47	62.86	48.25	47.55
Medium	40.74	29.58	37.44	35.81	25.00	28.57	37.72	40.41
Low	12.20	7.51	8.83	9.46	10.53	8.57	14.04	12.14
N/o close rel.								
6 or more	35.76	29.30	24.58	21.62	28.95	17.14	26.32	35.27
3 to 5	43.29	42.95	44.31	41.89	50.00	30.00	43.86	43.29
1 or 2	19.00	24.89	27.62	31.76	18.42	41.43	26.32	19.40
None	1.96	2.86	3.49	4.73	2.63	11.43	3.51	2.04
Discrimination								
Not exp.	99.19	79.38	89.06	74.83	75.00	91.43	91.23	98.47
Experienced	0.81	20.62	10.94	25.17	25.00	8.57	8.77	1.53
Year								
2022	45.94	46.26	44.61	50.68	51.32	44.29	53.51	45.98
2023	54.06	53.74	55.39	49.32	48.68	55.71	46.49	54.02
Total n	29961	454	659	148	76	70	114	31482

Note: Includes all cases regardless of missing information on other variables. Source: Norwegian Quality of Life Survey 2022 and 203, own calculations.

Table 2. Distribution of gender identities across operationalised measures.

Measure	Cis-men %/Median	Trans-men %/Median	Cis-women %/Median	Trans-women %/Median	Non-binary %/Median	Total %/Median
SAH						
Very good	17.53	14.29	17.49	19.63	12.50	17.49
Good	50.02	40.18	49.28	39.25	21.25	49.50
Neither nor	21.80	25.00	20.30	21.50	33.75	21.07
Bad	9.06	16.96	11.25	11.21	30.00	10.26
Very Bad	1.59	3.57	1.69	8.41	2.50	1.67
Age	51	45	48	44	27	49
Sexuality						
Heterosexual	96.26	77.68	95.23	82.24	23.75	95.45
Non-Hetero.	3.74	22.32	4.77	17.76	76.25	4.55
Foreign born						
No	87.06	58.04	87.49	50.47	83.75	87.05
Yes	12.94	41.96	12.51	49.53	16.25	12.95
Obj. Health						
Not reported	77.50	62.39	68.45	74.29	50.63	72.74
Reported	22.50	37.61	31.55	25.71	49.37	27.26
Employment						
Employed	91.94	79.46	87.22	81.31	72.50	89.40
Unemployed	8.06	20.54	12.78	18.69	27.50	10.60
Income quartile						
Highest quarter	34.19	17.86	30.61	17.76	16.25	32.20
Third quarter	27.78	22.32	26.57	14.02	16.25	27.07
Second quarter	21.01	14.29	22.45	26.17	26.25	21.75
Lowest quarter	17.03	45.54	20.37	42.06	41.25	18.98
Education						
Higher (>4 yrs)	14.86	9.82	14.19	4.67	11.25	14.46
Higher (1-4 yrs)	24.96	17.86	38.19	19.63	26.25	31.70
Secondary	43.59	33.04	33.05	40.19	33.75	38.12
Primary	13.90	31.25	12.65	22.43	23.75	13.37
None (specified)	2.69	8.04	1.91	13.08	5.00	2.35
Partner. Status						
Reg. Partner	48.16	41.82	43.72	41.51	12.50	45.76
Partnered	28.19	28.18	29.43	29.25	33.75	28.84
Separated	4.48	7.27	7.40	7.55	5.00	6.00
Remain. Partner	1.13	4.55	3.63	0.94	2.50	2.43
Unpartnered	18.04	18.18	15.82	20.75	46.25	16.98
Centrality						
High	46.79	50.45	48.09	42.86	56.25	47.48
Medium	40.98	40.54	39.98	38.10	27.50	40.42
Low	12.24	9.01	11.92	19.05	16.25	12.10
N/o close rel.						
6 or more	30.83	12.61	38.87	18.69	18.75	34.82
3 to 5	44.40	38.74	41.73	31.78	30.00	42.94
1 or 2	21.98	39.64	17.80	32.71	41.25	19.98
None	2.80	9.01	1.59	16.82	10.00	2.26
Discrimination						
Not exp.	95.44	84.40	87.48	81.13	48.75	91.17
Experienced	4.56	15.60	12.52	18.87	51.25	8.83
Year						
2022	45.76	45.54	45.83	45.79	42.50	45.79
2023	54.24	54.46	54.17	54.21	57.50	54.21
Total n	15714	112	16830	107	80	32843

Note: Includes all cases regardless of missing information on other variables. Source: Norwegian Quality of Life Survey 2022 and 203, own calculations.

variables before the predictive analysis. As this test statistic is generally recommended for crossing two nominal categorical variables, it might not be suitable due to the ordinal nature of SAH (Agresti, 2018). Therefore, a non-parametric method for ordinal variables, like Spearman's Roh, could be considered. However, since the SOGIs are not ordered, an arbitrary rank would have to be assigned. This is not more favourable than removing the ranks from SAH; thus, a Pearson's chi-squared was still conducted, which is also standard practice (Agresti, 2019). Furthermore, the predictive analysis establishes the proportions and directions of the associations between SOGI and SAH (Mehmetoglu & Jakobsen, 2022). The Pearson chi-squared statistics are significant[4] and thus indicate that sexual orientation and SAH are statistically dependent, as well as gender identity and SAH. This suggests considerable differences in SAH between the groups and that the differences are unlikely to be random (Mehmetoglu & Jakobsen, 2022). Therefore, predictive analyses are proceeded with.

Before fitting the regression models, reference categories of each variable were determined. These were set in line with the conceptualisation of inequality, measured as shortfalls from what is perceived to be the highest attainable (Harper & Lynch, 2017; Sen, 1995). Those expected to have the highest-rated health were set as the reference categories. In this case, heterosexual cis-gendered[5] 18-year-old men who are partnered, not foreign-born, employed, without lasting impairments, belonging to the highest income quarter with higher education (more than four years), living in a high centrality area, have six or more close friends, as well as not having experienced sexuality or gender-based discrimination. Due to the possible temporal effect between the survey rounds, another control variable was added to all models. This indicates the survey year, and 2022 becomes the reference category. Appendix B is again referred to for further details on the specific variables.

4.4.1. Fitting the Models

Since the dependent variable SAH is discrete, on an ordered scale and with an undefined space between the options, an appropriate and parsimonious method would be an ordered logistic regression. This model can produce odds ratios (OR) from which the likelihood of a lower health rating can be derived by grouping variables and interpreted easily (Mehmetoglu & Jakobsen, 2022). However, the assumptions of the ordered logistic regression should be

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[4] Sexual Orientation and SAH: Pearson chi-squared = 329.3447, Degrees of freedom = 24, Probability = 0.000; Gender Identity and SAH: Pearson chi-squared = 141.9557, Degrees of freedom = 16, Probability = 0.000. For more details, see Appendix C.
[5] In the models for analysing sexual orientations, the reference category is men collectively, as no distinction is made between cis- and non-cis genders.

considered, particularly the proportional odds assumption. Brant tests[6] were conducted to test the assumption that each pair of outcome groups has the same relationship. Unfortunately, the Brant test held significance, and the assumption was violated (for all assumption test results, see Appendix C). In an attempt to achieve proportional odds, the SAH variable was collapsed into a three-step scale (merging "very good" and "good" as well as "very bad" and "bad"). Nonetheless, this failed to provide sufficient improvements. Therefore, partial-proportional odds models, like the generalised ordered logistic regression, could be considered. Here, the proportional odds assumption can be relaxed for those variables that do not pass the Brant test (Williams, 2016). However, when evaluating different models, the trade-off between variance and bias should also be kept in mind. The generalised model would introduce a substantial increase in parameters. While this could typically decrease the possibility of bias, it requires sufficient model fit (Agresti, 2019). By dividing the already sparse cases of some identities (i.e. queer, asexual and non-binary) to predict different SAH outcomes separately, the model fit suffers. For gender identities it was even impossible to fit this model and a linktest[7] confirmed that the generalised model was not well-fitted for sexual orientations (also with collapsed SAH). Logically a non-proportional odds model suffers the same fate. Therefore, a more parsimonious model with a decent model fit was preferred, as it would sooner produce robust results due to a lesser degree of freedom, and its possible bias could be tested (Agresti, 2019).

Bearing this in mind, several studies utilise a dichotomous version of SAH, with the option "good" as opposed to "not-good" (merging "good" and "very good" in one category and the remaining options in the other category), and analyse it through a binary logistic regression (BLR; Manor et al., 2000). However, collapsing the SAH variable leads to a loss of information, as fewer distinctions can be made in the various answer categories. Moreover, the question arises of what to do with the middle category and the threshold for dichotomisation might have consequences (Fedorov et al., 2009). Yet, after conducting a BLR, Table 3 indicate correct classification rates of 78%for both sexual orientation and gender identity models. Both models also have an 89% sensitivity, the probability of someone indicating good SAH being classified as such. The probability of someone being classified with good SAH and truly reporting good SAH (positive predictive value) is 80%, again for both models. The BLRs are therefore considered to have a good model fit, and another linktest further confirms this. To then ensure the absence of multicollinearity, Variance Inflation Factors (VIF) were calculated

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[6] The assumption test statistics are calculated based on the final model specifications, including all variables.
[7] The test identifies model misspecification. However, the variables are appropriately included based on theory. Hence, it assesses the degree of uncertainty or in other words, the model fit (Mehmetoglu & Jakobsen, 2022).

Table 3. Classifications of binary logistic regressions predicting SAH of sexual orientations and SAH of gender identities

	Sexual Orientation		Gender Identity	
Classified SAH	*True "Good"*	*True "not good"*	*True "Good"*	*True "Not good"*
"Good"	18773	4503	19453	4736
"Not good"	2263	5427	2390	5982
Total	21036	10130	21843	10718
Sensitivity rate	89.24%		89.06%	
Positive predictive value rate	80.65%		80.42%	
Correctly classified rate	78.29%		78.11%	

Note: Classified "good" if predicted Pr("good")>= 0.5. Sensitivity = Pr(classified "good" | true "good"). Positive predictive value = Pr(true "good" | classified "good"). Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table 4. Variance Inference Factors (VIF)

Measure	Sexual Orientation VIF	Gender Identity VIF
Sexual orientation	1.07	-
Gender identity	-	1.06
Age	1.18	1.23
Gender	1.04	-
Non-heterosexual	-	1.04
Foreign-born	1.03	1.09
Employment status	1.18	1.18
Objective health	1.17	1.17
Partnership status	1.23	1.24
Income	1.21	1.22
Education	1.13	1.14
Centrality	1.05	1.05
N/o close relationships	1.09	1.10
General stress	1.21	1.22
Discrimination	1.05	1.10
Year	1.01	1.01
Mean VIF	*1.11*	*1.12*

Note: A VIF > 5 would indicate multicollinearity. The VIFs were calculated after conducting a regular linear regression as this is required in STATA. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

and portrayed in Table 4. As no VIF is above 5, multicollinearity was not assumed (Mehmetoglu & Jakobsen, 2022). Thus, BLRs predicting the likelihood of good (1) over not-good (0) SAH were conducted for the results of this thesis. To evaluate if the dichotomisation of the outcome variable influences these results, additional models with another threshold for SAH (i.e. "not bad" over "bad" SAH) were also produced. In case this provided incriminating results, these are discussed. This is proven to be an appropriate technique to analyse ordinal outcome variables that do not meet the proportional odds assumption (Bender & Grouven,

1998).

Finally, as the conducted regression is logistic, comparisons between model specifications should solely regard the direction and significance of the odds ratios. When calculating effect estimates in ordinary least-squared regressions, bias is introduced through unobserved heterogeneity: correlation between independent and omitted variables. In logistic regressions, change in model specification affects the coefficients regardless of the unobserved heterogeneity (Mood, 2009). Hence, the gravities of the odds ratios are not compared between model specifications. However, average marginal effects were calculated to compare probability estimates of each SOGI.

5. Results

The results will be presented in relation to their respective research sub-question, first by sexual orientation followed by gender identities. The sexual minority-specific hypotheses are evaluated along with the corresponding results before the gender identity section evaluates the gender minority-specific and general hypotheses. Descriptive statistics were already provided in Tables 1 and 2, while Figures 4 and 6 visualise the distribution of SAH. The main regression results are found in Tables 5 and 7, and the average predicted probabilities of each SOGI are depicted in Figures 5 and 7, respectively. No differences were found between the unweighted and weighted results at a 95% confidence level or in terms of ORs above/below one. Hence, the unweighted results are preferred to be included in the main text as the implications of weights for SOGI are uncertain. Some differences did occur for the SOGI parameters when adapting the dichotomisation threshold for SAH. Therefore, the predictions for not-bad SAH are included for these parameters in Tables 6 and 8. Weighted results and the complete regression tables for not-bad SAH can be found in Appendix D.

5.1. Sexual orientations

5.1.1. What are the personal and environmental characteristics of the SGM population, and are they similar to sexual and gender majorities?

Starting off, it is notable that the median ages of non-heterosexuals are substantially lower than that of heterosexuals. The even lower medians of minority identities other than lesbian and gay show similar notions as previous findings of increasingly diverse orientations among younger cohorts (Goldberg et al., 2020). However, this is likely more the case for women as they make up the clear majority of these identities, while men make up the majority

of lesbian/gay identities (62%). Most identities are Norwegian-born, and the proportion of foreign-born peaks at 23% for sexually fluid persons. Heterosexuals show the lowest proportion of limiting health impairments. While this is similar for lesbian/gay identities, the remaining groups have a higher prevalence, with pansexuals holding the highest (48%).

Sexually fluid persons hold one of the highest degrees of employment among sexual minorities, short only to lesbians and gays, while asexuals have the lowest employment rate (65%). Yet, all minorities fall short of the 90% employment rate of heterosexuals. Substantial differences between the minority and majority identities emerge across income as well, where the only identity with a high-income majority is heterosexual. Strikingly, an approximate 40% majority of bisexual, pansexual, queer and asexual identities belong to the lowest income group. While this could be related to younger ages, it is coherent with previously found income penalties (Valfort, 2017). This notion could be consistent with increased levels of education for lesbians and gays compared to heterosexuals. However, the remaining identities seem somewhat less educated.

More than 77% of heterosexuals are partnered, of which the majority are married or in a registered partnership. While a majority of lesbian/gay, bisexual, pansexual and sexually fluid individuals are partnered as well, the proportion is lower and mostly partnered without registration or marriage. Asexuals have the highest proportion of separated or remaining partners. However, a substantial majority of them are unpartnered (60%). All orientations have a majority living in high centrality areas, most notable for lesbian/gay, queer and asexual persons. Regarding the number of close relationships, the identities are somewhat similar. Still, heterosexuals hold the highest number of relationships, and asexuals proportionally represent those with the lowest number, with more than half having two close relationships or less. Unsurprisingly, close to no heterosexuals report being discriminated against based on sexuality (1%). However, the same cannot be said for sexual minorities. While the proportions are less extreme for some minority identities, a quarter of pansexuals and queers and 20% of lesbians/gays do report discrimination, the rest between 10% and 8%.

On average, it seems that while lesbians and gays are slightly different from heterosexuals, the remaining identities increasingly diversify across most characteristics. While the minority orientations are seemingly younger, they also hold lower prevalence among several conditions that were previously found to positively influence health outcomes, such as being partnered and increased numbers of close relationships. Particularly, income provided notable differences, with more than half of all minorities belonging to the lower income half,

except lesbians and gays. Concerning the first research sub-question, the sexual minority population seems to be distinguishable from sexual majorities in terms of health-influencing personal and environmental characteristics.

5.1.2. To what degree are there health status differences across SOGIs?

Figure 4 depicts a clear gradient of worsened health across orientations. Sexually fluid and lesbian/gay individuals have slightly higher proportions of bad and very bad SAH (henceforth "bad SAH") compared to heterosexuals. However, sexually fluid persons have a larger proportion of neither good nor bad ratings. Still, less than half of both groups report SAH lower than good (35% for lesbian/gay and 43% for fluid). The remaining identities all have less than 50% rating good or very good SAH (henceforth "good SAH"). Asexuals have the lowest proportion with 37%, whereas heterosexuals get close to 75%. Moreover, the previously calculated chi-squared statistic suggests that these differences are unlikely to be statistically unrelated (Mehmetoglu & Jakobsen, 2022).

The primary regression model (1, see Table 5) with sexual orientations only holds ORs below one for all sexual minority identities, indicating decreased odds of good SAH compared to heterosexuals. They can be ordered by decreasing odds: lesbian/gay, fluid, bisexual, pansexual, queer and asexual with the lowest odds. Lesbians and gays only have slightly lower odds, with an OR of 0.9, while the 0.3 OR of asexuals is substantial. This is still consistent with previous findings of lower health for LGBs and the gap for bisexuals (Elliott et al., 2015; Veenstra, 2011; Zeeman et al., 2019). Still, the odds for good SAH of lesbians and gays are

Figure 4. Self-Assessed Health across Sexual Orientations.
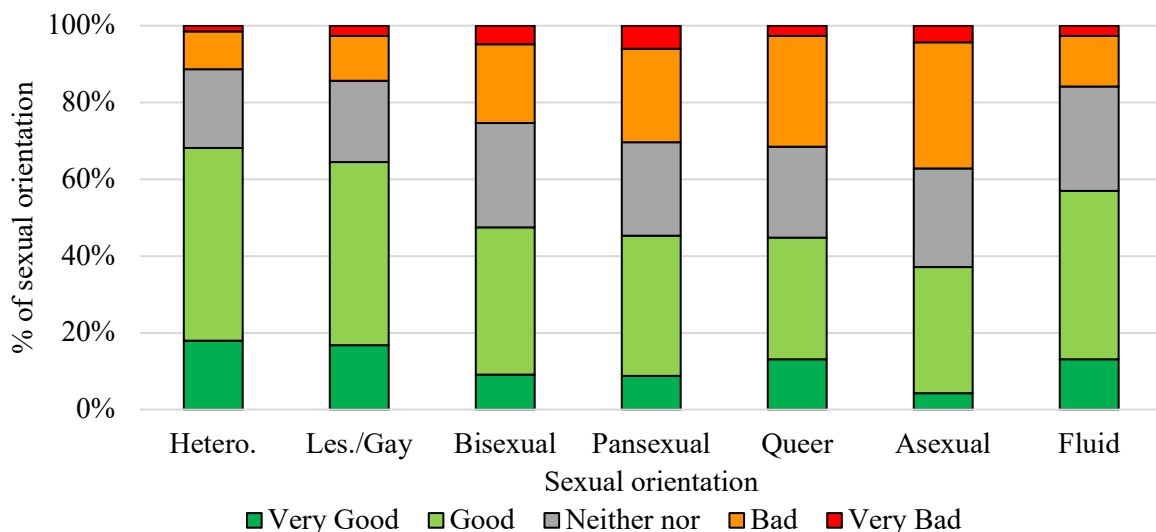
Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table 5. Binary logistic regression predicting good SAH of sexual orientations

	Good SAH (1)		Good SAH (2)		Good SAH (3)		Good SAH (4)	
Variables	OR	(CI)	OR	(CI)	OR	(CI)	OR	(CI)
Sexual orientation (Ref. Heterosex.)								
Lesbian/Gay	0.85	(0.70 - 1.04)	1.08	(0.85 - 1.40)	1.14	(0.89 - 1.45)	0.96	(0.59 - 1.54)
Bisexual	0.42*	(0.36 - 0.50)	0.53*	(0.44 - 0.64)	0.57*	(0.47 - 0.69)	0.63*	(0.41 - 0.99)
Pansexual	0.39*	(0.28 - 0.53)	0.68	(0.45 - 1.02)	0.73	(0.48 - 1.11)	0.75	(0.24 - 2.39)
Queer	0.38*	(0.24 - 0.59)	0.62	(0.36 - 1.08)	0.61	(0.34 - 1.07)	1.31	(0.33 - 5.27)
Asexual	0.28*	(0.17 - 0.45)	0.53*	(0.29 - 0.96)	0.62	(0.34 - 1.13)	0.79	(0.14 - 4.54)
Fluid	0.62*	(0.43 - 0.90)	0.85	(0.54 - 1.34)	0.90	(0.56 - 1.44)	0.71	(0.27 - 1.85)
Age			0.99*	(0.99 - 1.00)	1.00	(1.00 - 1.00)	1.00	(1.00 - 1.00)
Gender (Ref. Man)								
Woman			1.29*	(1.21 - 1.36)	1.20*	(1.13 - 1.28)	1.20*	(1.14 - 1.28)
Other			0.68	(0.34 - 1.17)	0.65	(0.37 - 1.14)	0.64	(0.36 - 1.14)
Foreign born			0.87*	(0.79 - 0.96)	1.00	(0.91 - 1.11)	1.00	(0.91 - 1.11)
Impaired			0.12*	(0.12 - 0.13)	0.12*	(0.12 - 0.13)	0.12*	(0.12 - 0.13)
Unemployed			0.35*	(0.32 - 0.38)	0.36*	(0.33 - 0.40)	0.36*	(0.33 - 0.40)
Income quarter (Ref. High)								
Third			0.83*	(0.78 - 0.9)	0.86*	(0.79 - 0.92)	0.86*	(0.80 - 0.93)
Second			0.72*	(0.66 - 0.78)	0.74*	(0.69 - 0.81)	0.74*	(0.68 - 0.80)
Lowest			0.74*	(0.67 - 0.81)	0.77*	(0.71 - 0.85)	0.77*	(0.70 - 0.85)
Les./Gay # Income								
# Third							0.90	(0.48 - 1.71)
# Second							1.74	(0.88 - 3.48)
# Lowest							1.40	(0.71 - 2.77)
Bisex. # Income								
# Third							1.03	(0.57 - 1.85)
# Second							0.93	(0.51 - 1.70)
# Lowest							0.77	(0.45 - 1.33)
Pansex. # Income								
# Third							0.68	(0.15 - 2.97)
# Second							0.74	(0.18 - 3.04)
# Lowest							1.35	(0.36 - 5.02)
Queer # Income								
# Third							0.94	(0.08 - 10.39)
# Second							0.34	(0.06 - 1.64)
# Lowest							0.42	(0.08 - 2.23)
Asex. # Income								
# Third							0.47	(0.05 - 4.21)
# Second							0.50	(0.062 - 4.07)
# Lowest							1.37	(0.19 - 10.10)
Fluid # Income								
# Third							0.89	(0.21 - 3.68)
# Second							2.76	(0.63 - 12.07)
# Lowest							1.15	(0.34 - 3.94)
Education (Ref. High >4yrs)								
Higher (1-4 yrs.)			0.73*	(0.66 - 0.80)	0.73*	(0.67 - 0.81)	0.74*	(0.67 - 0.81)
Secondary			0.52*	(0.47 - 0.57)	0.54*	(0.50 - 0.60)	0.55*	(0.50 - 0.60)

Table 5 (Continued). Binary logistic regression predicting good SAH of sexual orientations

Variables	Good SAH (1) OR	(CI)	Good SAH (2) OR	(CI)	Good SAH (3) OR	(CI)	Good SAH (4) OR	(CI)
Primary			0.46*	(0.41 - 0.51)	0.51*	(0.45 - 0.57)	0.51*	(0.45 - 0.57)
None (specified)			0.77*	(0.62 - 0.96)	0.82	(0.66 - 1.03)	0.82	(0.66 - 1.03)
Partnership status *(Ref. Reg. Partner.)*								
Partnered			0.92*	(0.86 - 0.99)	0.99	(0.92 - 1.07)	0.99	(0.92 - 1.06)
Separated			0.78*	(0.70 - 0.88)	0.89	(0.79 - 1.00)	0.89	(0.79 - 1.00)
Remain. Partner			0.71*	(0.59 - 0.85)	0.76*	(0.63 - 0.92)	0.76*	(0.63 - 0.92)
Unpartnered			0.65*	(0.59 - 0.71)	0.73*	(0.66 - 0.80)	0.73*	(0.66 - 0.80)
Centrality *(Ref. High)*								
Medium					0.95	(0.90 - 1.01)	0.95	(0.90 - 1.01)
Low					0.94	(0.86 - 1.03)	0.94	(0.86 - 1.03)
N/o close friends *(Ref. 6 or more)*								
3 to 5					0.64*	(060 - 0.70)	0.64*	(0.60 - 0.68)
1 or 2					0.40*	(0.37 - 0.43)	0.40*	(0.37 - 0.43)
None					0.32*	(0.26 - 0.39)	0.32*	(0.26 - 0.39)
Discriminated					0.9	(0.71 - 1.14)	0.89	(0.71 - 1.13)
Year 2023 *(Ref. 2022)*	0.93*	(0.88 - 0.97)	1.05	(0.99 - 1.11)	1.05	(1.00 - 1.11)	1.05	(1.00 - 1.11)
Constant	2.350e +67*		1.62e-41	(9.31e-40)	1.83e-44	(1.07e-42)	1.83e-44	(1.07e-42)
Observations	31,482		31,249		31,166		31,166	

Note: 95% confidence intervals in parentheses. * p<0.05. Source: Norwegian Quality of Life Survey 2022 and 203, own calculations.

Table 6. Binary logistic regression predicting not bad SAH of sexual orientations (selected parameters).

Variables	Not-bad SAH (1) OR	(CI)	Not-bad SAH (2) OR	(CI)	Not-bad SAH (3) OR	(CI)	Not-bad SAH (4) OR	(CI)
Sexual orientation *(Ref. Heterosex.)*								
Lesbian/Gay	0.76*	(0.58 - 0.99)	0.97	(0.70 - 1.34)	1.08	(0.77 - 1.51)	0.61	(0.32 - 1.18)
Bisexual	0.38*	(0.31 - 0.45)	0.55*	(0.44 - 0.69)	0.60*	(0.46 - 0.74)	0.41*	(0.23 - 0.74)
Pansexual	0.30*	(0.20 - 0.41)	0.53*	(0.334 - 0.84)	0.62*	(0.38 - 0.99)	0.18*	(0.050 - 0.66)
Queer	0.28*	(0.17 - 0.45)	0.40*	(0.22 - 0.75)	0.43*	(0.23 - 0.79)	0.85	(0.19 - 3.76)
Asexual	0.22*	(0.13 - 0.35)	0.49*	(0.26 - 0.92)	0.57	(0.30 - 1.06)	0.30	(0.043 - 2.11)
Fluid	0.68	(0.41 - 1.12)	0.94	(0.50 - 1.74)	1.02	(0.54 - 1.91)	0.57	(0.15 - 2.16)
Income quarter *(Ref. High)*								
Third			0.80*	(0.71 - 0.90)	0.82*	(0.73 - 0.93)	0.81*	(0.72 - 0.91)
Second			0.69*	(0.61 - 0.77)	0.72*	(0.64 - 0.81)	0.70*	(0.62 - 0.79)
Lowest			0.70*	(0.62 - 0.79)	0.74*	(0.65 - 0.84)	0.71*	(0.62 - 0.81)
Les./Gay # Income								
# Third							1.64	(0.66 - 4.03)
# Second							1.92	(0.75 - 4.90)
# Lowest							2.75*	(1.11 - 6.84)
Bisex. # Income								
# Third							1.31	(0.60 - 2.83)

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Table 6 (Continued). Binary logistic regression predicting not bad SAH of sexual orientations (selected parameters).

Variables	Not-bad SAH (1) OR	(CI)	Not-bad SAH (2) OR	(CI)	Not-bad SAH (3) OR	(CI)	Not-bad SAH (4) OR	(CI)
# Second							1.43	(0.68 - 3.00)
# Lowest							1.68	(0.85 - 3.33)
Pansex. # Income								
# Third							4.37	(0.75 - 25.52)
# Second							2.26	(0.47 - 10.86)
# Lowest							5.27*	(1.23 - 22.63)
Queer # Income								
# Third							1.08	(0.05 - 22.11)
# Second							0.65	(0.11 - 3.92)
# Lowest							0.27	(0.05 - 1.57)
Asex. # Income								
# Third							3.69	(0.34 - 40.48)
# Second							1.52	(0.16 - 14.39)
# Lowest							1.74	(0.19 - 15.72)
Fluid # Income								
# Third							1.05	(0.17 - 6.60)
# Second							4.55	(0.36 - 58.41)
# Lowest							2.42	(0.47 - 12.41)
Observations	31,482		31,249		31,166		31,166	

Note: 95% confidence intervals in parentheses. * $p<0.05$. See Appendix D for regression table including all parameters. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

not significantly different to heterosexuals at a 95% confidence level. The remaining minority identities do attain a statistical difference at this level. However, looking at their confidence intervals, they overlap, and their differences to heterosexuals are therefore not significantly different from each other.

Considering the effect of dichotomisation of SAH, Model 1 in Table 6 predicts not-bad SAH over bad SAH. The results are rather consistent with the predictions for good SAH. While all ORs are still below 1, there are slight consequences to the dichotomisation. This concerns lesbian and gay identities, which now have significantly lower odds than heterosexuals of not-bad SAH, at a 95% confidence level. This somewhat implicates the argument that lesbian/gay individuals have substantially worse health outcomes than heterosexuals. However, unfavourable differences are still present.

It seems that sexual orientations do have different health statuses when looking at their reporting of SAH. While this difference is minimal between the heterosexual and lesbian/gay groups, differences among several other sexual minority identities are also less substantial. However, bisexual, pansexual and queer identities do have a significantly lower likelihood of favourable SAH compared to heterosexuals, and asexuals have the lowest likelihood. This

lends support to the hypothesis: *(H1a) Among sexual minorities, lesbians and gays report the highest SAH, followed by bisexual, pansexual, queer and sexually fluid individuals. Asexual individuals report the lowest SAH.*

5.1.3. When considering other personal and environmental characteristics, how does SOGI predict health status?

As stated in the analysis plan, due to the chosen method, comparisons between model specifications should only be made regarding the significance and direction of ratios (Mood, 2009). Nonetheless, the second model has already introduced such changes when controlling for several personal characteristics. The OR of lesbian/gay is now above 1, suggesting higher odds of good SAH compared to the reference category. Moreover, no identities but bisexuals and asexuals maintain significantly lower odds at a 95% confidence level, yet this is only retained by bisexuals in the following models. The introduction of environmental characteristics in Model 3 does not seem to affect the OR significance and direction for sexual minorities.

Looking at other personal characteristics, increased age only seems to slightly lower the odds of good SAH, keeping all else constant, and it loses effect and significance in the remaining models. What is also surprising is that women are predicted to have higher odds of good SAH than men, also when considering environmental factors. However, the gender identity analysis might provide more insights into this issue. On the other hand, the odds for foreigners are lower. Yet, they seem to be somewhat affected by environmental characteristics, as they lose significance and lower odds (although only minimally higher) when these are included. However, health impairments are consistently associated with significant and substantially lower odds of good SAH compared to the reference categories and keeping all else constant, echoing previous studies (Bailis et al., 2003). Similarly, but with less gravity, unemployment also negatively influences the odds of good SAH.

Like the findings of Olsen et al. (2020), the models depict lower-income groups having a decreased likelihood of good health. However, there is no gradual decrease towards the lowest group. When interacting sexual orientation with income in Model 4, there does not seem to be a significantly different effect for the orientations dependent on income. However, if not considering significance, the model suggests lower odds for all sexual minorities except queers, compared to heterosexuals, given high income and all else constant. Queer persons do achieve lower odds when belonging to the second and the lowest income quartile ($OR^{\text{Queer \# second income}}$ = 1.3 * 0.7* 0.3 * = 0.3; $OR^{\text{Queer \# lowest income}}$ = 1.3 * 0.8 * 0.4 * = 0.4). For bisexuals, who hold

the only significantly lower odds given high income, the odds decrease from the second income group but always stay lower than heterosexuals in corresponding groups ($OR^{\text{Bisex. \# third income}} = 0.6 * 0.9 * 1.0 * = 0.5$; $OR^{\text{Bisex. \# second income}} = 0.6 * 0.7 * 0.9 * = 0.4$; $OR^{\text{Bisex. \# lowest income}} = 0.6 * 0.8 * 0.8 * = 0.4$). There are some inconsistencies in the remaining identities. The odds are primarily lower than heterosexuals at the same income levels, except for second and lowest-income lesbian/gay and fluid persons. As well as the lowest-income pansexuals and asexuals.

Returning to the remaining significant findings, decreased education is also generally associated with lower odds of good SAH. However, this is uncertain for the lowest and unspecified group when also considering environmental characteristics. Moreover, while it seems to be health-promoting to be married or in a registered partnership, this benefit is only achieved over remaining partners/widowed persons and unpartnered individuals in the following models. Furthermore, the degree of centrality seems less influential than previous studies have suggested (Pearce & Dorling, 2006). On the other hand, the arguments about the importance of an increased number of close relationships appear to be accurate, as the ORs significantly decrease towards the lower categories (Seeman, 1996; Umberson & Thomeer,

Figure 5. Predictive margins for good SAH with 95% CIs of Sexual Orientations.
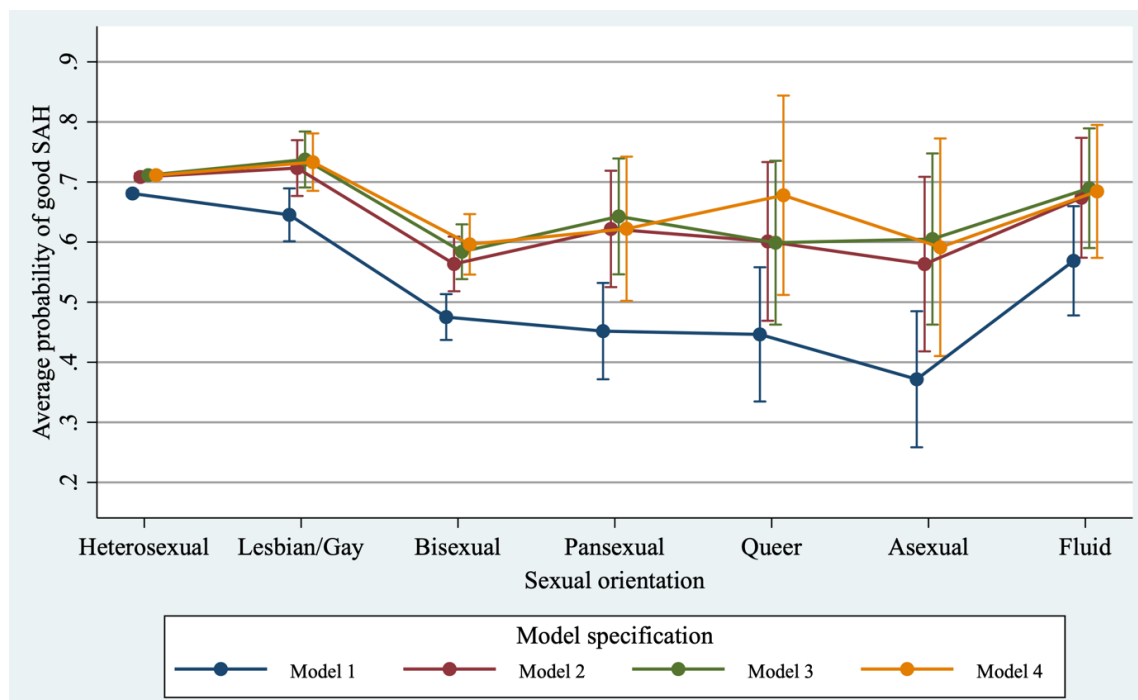
Note: CIs = Confidence intervals. Based on results from binary logistic regressions. Covariates kept at mean average, stepwise adjusted for: (from Model 1) Year of survey, (form Model 2) age, gender, foreign born, health impairment, employment, income, education, partnership status, (form Model 3) centrality, number of close relationships, sexuality-based discrimination, (from Model 4) interaction between income and sexual orientation. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

2020). Yet, the effect of sexuality-based discrimination is minimal and not determinantal.

Again, some changes were introduced in the corresponding not-bad SAH models. This time, lesbian/gay persons do not achieve significantly lower odds at a 95% confidence level, but other identities do. Pansexuals have significantly lower odds than heterosexuals for not-bad SAH in all specifications, keeping all else constant and given reference categories. Where the same group previously had slightly higher (insignificant) odds than heterosexuals when part of the lowest-income group, this is now lower (OR $^{\text{Pansex. \# lowest income}}$ = 0.2 * 0.7 * 5.0 = 0.6). Queer persons also achieve significantly lower odds than heterosexuals as long as identity income differences are not considered (all else constant). The remaining income differences between the identities are again inconsistent, yet accounting for these differences is suggested to mostly decrease the gaps towards corresponding heterosexuals.

Ultimately, when considering other socio-demographic characteristics, it seems that the power of sexual orientation to predict good SAH becomes less, and the odds are smaller than those of other characteristics. While the dichotomisation of SAH again introduces some changes, it is still suggested that most minority identities are worse off than heterosexuals. However, this should be considered with caution. Nevertheless, the predicted probabilities depicted in Figure 5 also support this notion. Even if several confidence intervals overlap, the difference between the identities stays more or less the same. It is also clear that when other characteristics are controlled for (kept at mean average), the probability for minorities to achieve good SAH becomes higher. In the end, this validates the hypothesis: *(H2a) The negative effect of having a minority sexual orientation on SAH is weaker than the effects of the remaining personal and environmental characteristics.*

5.2. Gender identities

5.2.1. What are the personal and environmental characteristics of the SGM population, and are they similar to sexual and gender majorities?

As for sexual minorities, the median age of gender minorities is lower than that of the majority identities. However, while the differences are four years between trans and cis genders, non-binaries are considerably younger, with a median of 27 years. The vast majority of all men and women are heterosexual, although the proportion of non-heterosexual identities is higher among trans genders. Contrastingly, only 24% of non-binary individuals identify as heterosexual. However, this may partially relate to their rejection of gender binaries. On the other hand, non-binary persons do show similarity to cis-genders in terms of origin country.

More than 80% of them are Norwegian-born, while trans individuals are to a much higher degree foreign-born—half of trans-women. Moreover, half of non-binary persons indicate having a limiting health impairment as the highest proportion, while cis-men have the lowest with 23%. Trans-men have a notably higher prevalence compared to their cis-gendered counterparts. However, among women, cis-gendered persons indicate more impairments than trans persons.

In terms of employment, the rates are slightly higher for cis-women than trans-women, while this difference is more prominent between the men. Non-binaries hold the lowest employment rate, with almost a third being unemployed. Large proportions (>40%) of gender minorities belong to the lowest income quarter. While this could be related to their age, it is consistent with socio-economic inequalities previously established among gender minorities (Kolk et al., 2023). The smaller difference between trans-men and cis-women compared to the difference between trans-women and cis-men also supports the post-transition penalty found to affect trans-women primarily (Geijtenbeek & Plug, 2018). However, gender minorities do seem to be less educated than the cis genders.

Interestingly, trans and cis genders are very consistent in terms of partnering, mostly being in registered partnerships or married. Only non-binary individuals show notable differences. While they have a similar rate of non-registered partnerships, they are much less in registered partnerships/marriages. Consequently, about half are unpartnered. They further distinguish themselves by having the highest proportion living in high-centrality areas, where trans and cis men and women are again similar. Although trans men have a higher proportion of residents with high centrality and a lower proportion with low centrality compared to cis men, while the opposite is true for women. Furthermore, gender minorities do seem to have fewer close relationships than cis-genders, which could be expected due to the social hardship in their relationships (Lewis et al., 2023). However, they report more gender-based discrimination as well. Even as cis-women also report some discrimination, the proportion is 6% higher for trans-women. Astonishingly, just more than half of non-binary persons indicate that they have been discriminated against.

Compared to the majority identities, it seems that non-binary persons distinguish themselves the most across the considered characteristics. At the same time, transgenders are often only slightly different than their cis-gendered counterparts or even similar, like in partnering. However, gender minorities generally portray less health-favourable conditions than the gender majorities, particularly in socio-economic terms and the number of close

relationships. Consequently, while some differences are less than those of sexual orientations, the described characteristics suggest that also the gender minority population is distinguishable from the gender majority population.

5.2.2. To what degree are there health status differences across SOGIs?

As seen in Figure 6, most gender identities hold low proportions of very bad SAH, and only trans-women are notably higher with 8%. However, compared to the majority genders, gender minorities to a higher degree indicate bad or very bad SAH (henceforth "bad SAH"), most substantially non-binary individuals with an astonishing 33%. Yet, the proportion is approximately double for trans-men than for cis-men, while this difference is lesser between the women. Moreover, trans-women do report the highest degree of very good SAH as well (20%). Nevertheless, the cis-genders have the largest proportions of very good and good SAH (henceforth "good SAH"), both over 65%. However, the gap towards transgenders is larger for women than for men. Non-binary individuals report the lowest percentage of favourable SAH, namely 34%. Similar to sexual orientation, the chi-squared statistic indicated that the differences in SAH between the gender identities are likely not random (Mehmetoglu & Jakobsen, 2022).

The first regression model (1, see Table 7) for gender identities shows decreased odds for good SAH for gender minorities compared to cis-men, which aligns with the descriptives.

Figure 6. Self-Assessed Health across Gender Identities.
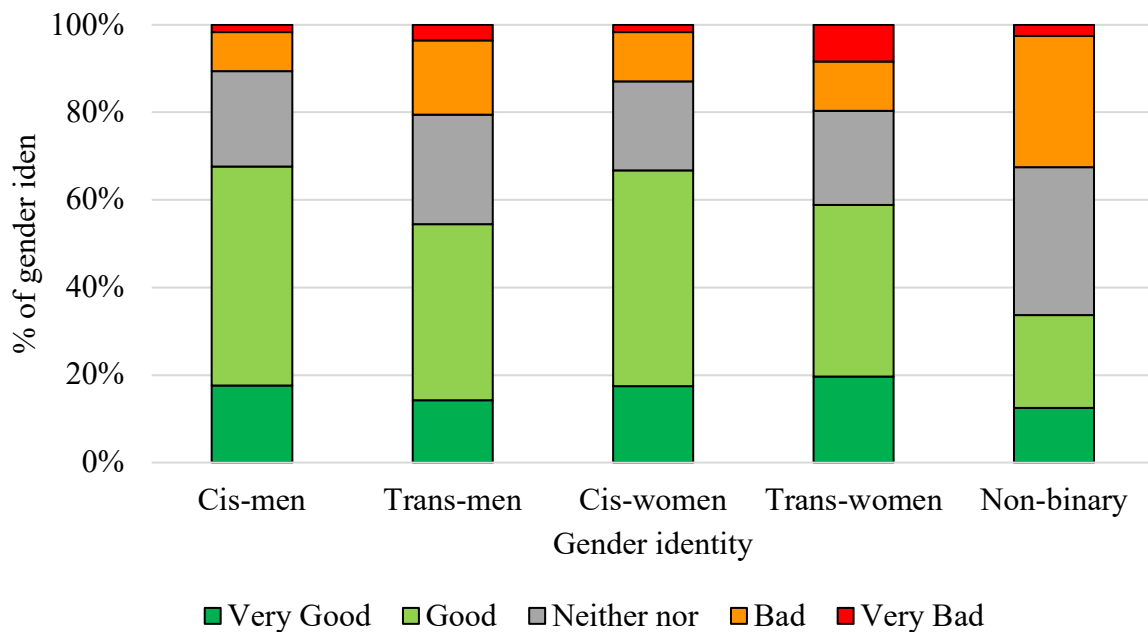
Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table 7. Binary logistic regression predicting good SAH of gender identities

Variables	Good SAH (1) OR	(CI)	Good SAH (2) OR	(CI)	Good SAH (3) OR	(CI)
Gender						
(Ref. Cis-man)						
Trans-man	0.58*	(0.40 - 0.84)	1.02	(0.64 - 1.62)	1.23	(0.76 - 1.98)
Cis-woman	0.97	(0.92 - 1.01)	1.27*	(1.20 - 1.34)	1.22*	(1.15 - 1.29)
Trans-woman	0.70	(0.47 - 1.01)	0.96	(0.61 - 1.50)	1.09	(0.69 - 1.71)
Non-binary	0.25*	(0.15 - 0.39)	0.55*	(0.32 - 0.95)	0.63	(0.36 - 1.12)
Age			1.00	(0.99 - 1.00)	1.00	(0.99 - 1.00)
Non-Heterosexual			0.71*	(0.62 - 0.81)	0.74*	(0.65 - 0.5)
Foreign born			0.87*	(0.79 - 0.95)	0.99	(0.91 - 1.09)
Impaired			0.12*	(0.12 - 0.13)	0.12*	(0.12 - 0.13)
Unemployed			0.36*	(0.33 - 0.40)	0.38*	(0.34 - 0.41)
Income quarter						
(Ref. High)						
Third			0.84*	(0.78 - 0.90)	0.86*	(0.80 - 0.93)
Second			0.72*	(0.67 - 0.78)	0.75*	(0.69 - 0.81)
Lowest			0.73*	(0.67 - 0.80)	0.77*	(0.71 - 0.85)
Education						
(Ref. Higher > 4 yrs.)						
Higher (1-4 yrs.)			0.75*	(0.68 - 0.82)	0.75*	(0.68 - 0.82)
Secondary			0.52*	(0.48 - 0.57)	0.55*	(0.50 - 0.60)
Primary			0.46*	(0.42 - 0.52)	0.51*	(0.45 - 0.57)
None (specified)			0.79*	(0.64 - 0.96)	0.81*	(0.66 - 1.00)
Partnership status						
(Ref. Reg. Partner)						
Partnered			0.93	(0.87 - 1.00)	1.01	(0.93 - 1.08)
Separated			0.81*	(0.73 - 0.91)	0.92	(0.81 - 1.03)
Remain. partner			0.71*	(0.59 - 0.84)	0.77*	(0.64 - 0.92)
Unpartnered			0.66*	(0.61 - 0.72)	0.75*	(0.68 - 0.82)
Centrality *(Ref. High)*						
Medium					0.95	(0.89 - 1.01)
Low					0.93	(0.85 - 1.02)
N/o close friends						
(Ref. 6 or more)						
3 to 5					0.64*	(0.60 - 0.68)
1 or 2					0.41*	(0.38 - 0.44)
None					0.33*	(0.27 - 0.40)
Discriminated					0.77*	(0.70 - 0.85)
Year 2023	0.93*	(0.88 - 0.97)	1.05	(0.99 - 1.10)	1.05	(0.99 - 1.11)
(Ref. 2022)						
Constant	7.474e+68*	(3.568e+70)	5.69e-39	(3.20e-37)	6.13e-42	(3.48e-40)
Observations		32,843		32,690		32,561

Note: 95% confidence intervals in parentheses. * p<0.05. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table 8. Binary logistic regression predicting not bad SAH of gender identities (selected parameters).

Variables	Not-bad SAH (1) OR	(CI)	Not-bad SAH (2) OR	(CI)	Not-bad SAH (3) OR	(CI)
Gender *(Ref. Cis-man)*						
Trans-man	0.46*	(0.29 - 0.73)	0.90	(0.51 - 1.58)	1.03	(0.57 - 1.85)
Cis-woman	0.80*	(0.75 - 0.86)	1.15*	(1.06 - 1.25)	1.10*	(1.01 - 1.20)
Trans-woman	0.49*	(0.30 - 0.79)	0.56	(0.31 - 1.01)	0.63	(0.36 - 1.13)
Non-binary	0.25*	(0.16 - 0.40)	0.80	(0.44 - 1.45)	1.03	(0.56 - 1.89)
Observations		32,843		32,690		32,561

Note: 95% confidence intervals in parentheses. * p<0.05. See Appendix D for regression table including all parameters. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Across identities, the odds decrease in the following order: cis-women, trans-women, trans-men, and non-binary individuals. It is noticeable that the OR of Trans-men is lower than that of trans-women. While this is different from what was expected and previous findings, other studies have also found varying in-group differences between gender minorities alone (Crissman et al., 2019; Goldsen et al., 2022; Streed Jr et al., 2018). Nevertheless, non-binaries hold a considerably lower OR, making their odds for good SAH only 0.2 times that of cis-men. Still, only trans-men and non-binary have lower odds that are statistically significant at a 95% confidence level. However, adjusting the threshold of dichotomisation introduces changes to the significance. Table 8 shows all gender identities having significantly lower odds of not-bad SAH compared to cis-men in the baseline model. The gravitational order of the ORs is maintained, but no further clarity regarding minority in-group differences is provided. By looking at their confidence intervals, it becomes clear that the lower odds for non-binary are different than the lower odds for cis-women compared to cis-men. This cannot be said with confidence about the trans-identities.

While it was hypothesised that trans-women would have lower SAH than trans-men, this is not predicted to be the case. Still, trans-women are more extreme in their reporting of SAH. Moreover, non-binary persons both report the lowest SAH and are predicted substantially lower odds of good SAH compared to cis-men, with significance. Considering this, there is some support for the hypothesis: *(H1b) Among gender minorities, the SAH decreases from trans-men to trans-women, while non-binary individuals report the worst SAH.* However, with respect to the research sub-question, while there are differences in health outcomes across gender identities, it is not substantial between all of them.

Taking into account the results of sexual orientation, the relevant general hypothesis can be evaluated: *(H1) Heterosexuals report better SAH than all sexual minorities, and Cis-gendered individuals report better SAH than all gender minorities.* All minority identities were predicted to have lower odds of good SAH compared to the majority identities in the baseline models (1). However, this could not be stated with statistical confidence at a 95% level for all SGMs (i.e. Lesbian/gay and Trans-women). Yet, complete significance was achieved in the corresponding not-bad SAH models without confidence intervals overlapping those of heterosexuals or cis genders. Moreover, the descriptive results also depict lower proportions of good SAH and higher proportions of bad SAH for SGMs over the majority identities. Hence, the hypothesis is ultimately validated.

5.2.3. When considering other personal and environmental characteristics, how does SOGI predict health status?

When controlling for personal characteristics, the predicted odds of good SAH change considerably. Trans-men no longer have significantly lower odds compared to cis-men, and the model even suggests little difference in odds (all else constant). Like in the analysis on sexual orientations, cis-women have higher odds than men. This likely relates to their remaining characteristics, yet such differences are not accounted for in this case. Trans-women, on the other hand, are still not significantly different and now hold a OR close to one. The odds for non-binary are still significant and substantially lower than that of cis-men (at a 95% confidence level and keeping all else constant). However, when introducing environmental characteristics, the odds difference is still lower but no longer significant.

The remaining parameters are vastly consistent with the sexual orientation models. This is not surprising as the variables are mostly the same. It is still worth noting that non-heterosexual identities collectively have significantly lower odds for good SAH than the reference categories. Otherwise, the impact of the number of close relationships continues to

Figure 7. Predictive margins for good SAH with 95% CIs of Gender Identities
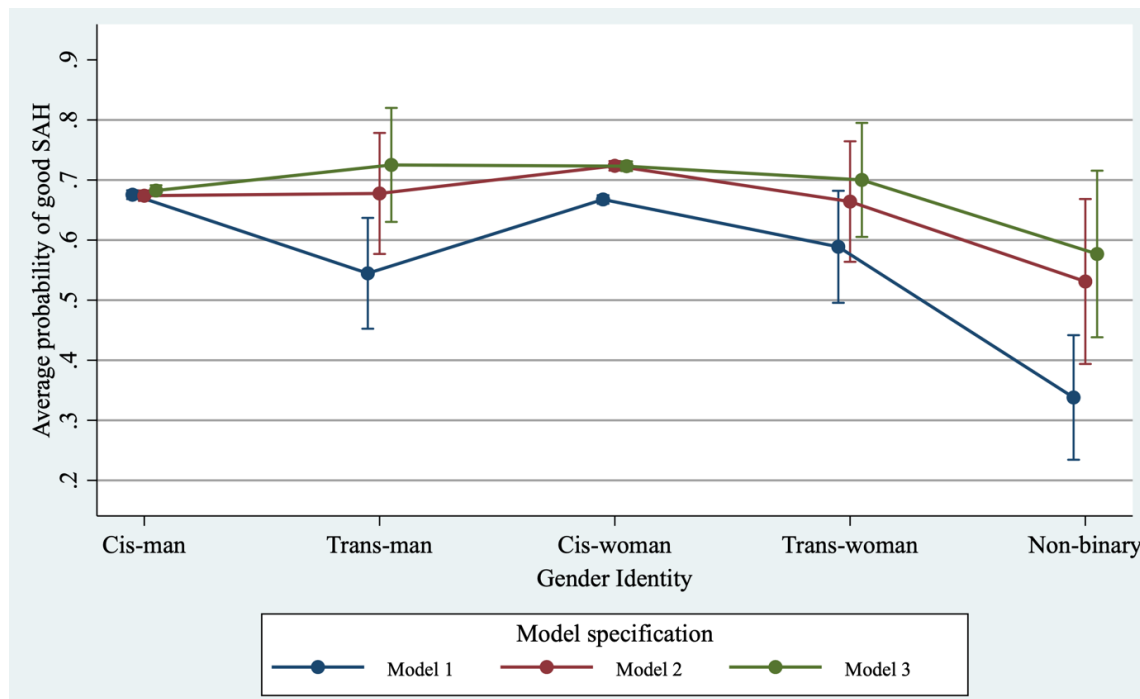
Note: CIs = Confidence intervals. Based on results from binary logistic regressions. Covariates kept at mean average, stepwise adjusted for: (from Model 1) Year of survey, (form Model 2) age, sexuality, foreign born, health impairment, employment, income, education, partnership status, (form Model 3) centrality, number of close relationships, gender based discrimination. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

be an intriguing and robust finding. For instance, it remains more influential than both income and minority identity on the odds for good SAH. Model 3 provides another interesting significant finding in that those having experienced gender-based discrimination have odds that are 0.7 that of those not having experienced it.

Furthermore, the dichotomisation of SAH is less influential in the final two models. While Trans-men achieve lower odds compared to cis-men in the second model, significance is still not achieved. The same happens to trans-women, but then in Model 3. Cis-women stay consistent, as do the odds of non-binary, but they lose significance. This again indicates that the decreased likelihood of favourable SAH for gender minorities is likely stronger related to other socio-demographic characteristics. As also seen in Figure 7, the predicted probability for minority identities to achieve good SAH is suggested to increase when the average of other influences is controlled for. However, the gravity of these effects seems somewhat different between the minority identities, as the gaps between the markers are not entirely proportional. Even as confidence intervals largely overlap. Hence, there is support for the hypothesis: *(H2b) The negative effect of having a minority gender identity on SAH is weaker than the effects of other personal and environmental characteristics.*

Looking at the final models of both gender identities and sexual orientations, there are supportive notions towards the second general hypothesis: *(H2) Socio-demographic personal and environmental characteristics influence SAH.* As seen in Figures 5 and 7, the SAH of the identities are predicted differently when additional characteristics are accounted for. However, not all measured characteristics provided robust influences. Moreover, SOGI is also considered a personal characteristic. While it predicted significant differences in the baseline models, these proved not to rely on SOGI alone in the following models. Yet, several other characteristics significantly influenced the odds of good SAH. Socioeconomic factors, in particular, seemed influential, as well as the number of close relationships in one's environment. All things considered; the hypothesis can only be partly validated. Socio-demographic personal and environmental characteristics do indeed influence SAH, but not all.

6. Discussion

In this final chapter of this thesis, the findings are extensively discussed. First, the main takeaways are summarised together with the research objective and main expectations. Thereafter, they are discussed in relation to existing theories and previous findings that made up the theoretical framework before the limitations and strengths of the research are elaborated

on. Based on these forgoing sections, the main recommendations for future research and policies are presented at the end, along with the final conclusion.

6.1. Summary of Objective, Expectations and Findings

This thesis sought to investigate the contemporary Sexual and Gender Minority (SGM) population and their health outcomes through comprehensive inclusions of Sexual Orientations and Gender Identities (SOGI) while maintaining an appropriate approach in comparing identities in a representable sample at a national level. This was executed by analysing the health outcomes of the SGM cases of the Norwegian Quality of Life Survey against its remaining sample that could be identified as sexual and gender majorities (cis-genders and heterosexuals). Health disparities were expected for SGMs as they face scrutiny by breaking with heteronormativity that is structurally embedded in both micro and macro levels of society (Hatzenbuehler & Link, 2014; Meyer, 2003; Rutter & Jones, 2018). Additionally, it was expected that this would lead to varying magnitudes of disparity between SGM identities. Certain identities have likely gained social acceptance and more widespread cultural knowledge, leading to a hierarchy among them (Connell & Messerschmidt, 2005; McCormack, 2013; Risman, 2018). To investigate the validity of these expectations, the health outcomes of each SOGI were measured through the SAH and separately analysed and tested. The results revealed that all minority identities reported lower SAH than the majorities, and their health outcomes were predicted lower in most cases.

However, these outcomes were also related to several other socio-demographic factors expected to predict social group health differences. Personal characteristics, like age and income, and environmental characteristics, like availability of services and amenities, have been proven influential in several studies (Dahlgren & Whitehead, 2007; Olsen et al., 2020; Salmela, 1993). These factors were first described by each SOGI, revealing that the SGM population was distinguishable from Norwegian majorities. When the characteristics were tested alongside SOGI in predicting good SAH, conditions like higher income and increased number of close relationships proved to be more determinantal. Yet, SGMs scored exceedingly low on these characteristics.

6.2. Findings in Relation to Theory and Previous Studies

First of all, the health differences and the uneven distribution of characteristics across SOGI support the theory that hierarchical gender structures, minority stress and structural stigma constrain opportunities for SGMs (Hatzenbuehler & Link, 2014; Meyer, 2003; Risman,

2018). Particularly non-binaries, who reported an astonishing 50% prevalence of experienced gender-based discrimination, demonstrated a basic principle of minority stress: discrimination by breaking heteronormativity (Meyer, 2003). However, establishing a causal link remains impossible. Nevertheless, there might also be truth to the possibility of a dynamic hierarchy since Norwegian lesbians and gays held only slightly different characteristics than heterosexuals, as did trans men and women to cis genders. Since lesbians and gays were also predicted to be the least penalised in health, they have clearly developed since the conceptualisation of hegemonic genders (Connell, 1995; Connell & Messerschmidt, 2005). This agrees with the gained social acceptance of gay men as previously described (McCormack, 2013). Moreover, further developments could be expected in the future, as the increasingly diverse SGM identities are younger, as already suggested by Goldberg et al. (2020).

Be that as it may, the outcomes of lesbian and gay identities are surprising as they have been structurally found to have worse health than heterosexuals (Zeeman et al., 2019). It is also contradictory to the conclusions of Liu and Reczek (2021) that disparities of LGB individuals only increase. Yet, bisexuals still portray significant disparities. Moreover, Godfrey et al. (2023) concluded with similar health reporting of bisexual, queer and pansexual persons, and this has not been disproven. While this could again relate to developments in social positions, it is difficult to characterise it as a positive development for sexual minorities overall. For instance, the substantial disparity for asexuals was not found when previously studied (Greaves et al., 2017). However, the income levels could provide a partial explanation (Olsen et al., 2020). These identities held large proportions among the lowest income quarter. Still, bisexuals were even further penalised through income, and the other identities experienced little difference. It could thus be that the health return of income is disproportionate, similar to what Assari and Bazargan (2019) found for education. Be that as it may, this would need further investigation as these results were rather inconclusive.

The findings on genders introduce some inconsistencies towards existing research. Women are expected to score lower in health indicators than men (Dahlgren & Whitehead, 2007). However, this has not been portrayed in the present findings. Even as Norway has been described as having high gender equality, the findings still seem a bit obscure (Sperre Saunes et al., 2020). Previous studies have also described trans men and women as having a lower likelihood of good health (Goldsen et al., 2022). While this is also the takeaway of this thesis, the results are not as pronounced. However, underlying mechanisms likely need further

investigation as studies have also been contradictory regarding in-group differences (Crissman et al., 2019; Streed Jr et al., 2018). The findings of non-binary persons suggest that further investigating SGM-specific effects of other established health influences will likely aid in solving these issues. This is because non-binary persons held the least health-favourable personal and environmental conditions and, subsequently, the most substantial and robust lower odds of good SAH among gender identities.

Those identities scoring low on SAH held several other conditions previously established to influence health negatively. For instance, being partnered should be beneficial for one's health (Dahlgren & Whitehead, 2007). This is demonstrated by Asexuals, who were already expected to be less partnered by previous studies and also proved to be majorly unpartnered and predicted lower SAH (Greaves et al., 2017). This was also the case for non-binaries. The outcomes of these same two identities supported the proven importance of having qualitative social contacts by representing those with the least number of close relationships (Seeman, 1996; Umberson & Thomeer, 2020). This somewhat implicates the predictive power of SOGI towards health outcomes, as was also depicted in the remaining findings. Still, the baseline statistical models depicted unequal health outcomes of SGM identities, which, as argued earlier, should be recognised regardless. Yet, the strong association between the likelihood of lower SAH across a decreasing number of close relationships depict chances to apprehend sociocultural factors and interact with structural stigma so that conditions might improve (Hatzenbuehler & Link, 2014; Meyer, 2003). As does the general association with income levels. This is related to the long-standing warnings against focusing too much on the victims of inequality rather than interacting with the underlying structural issues (Kitzinger, 1997). This means that objective-view interventions are preferred over subjective-view interventions (Meyer, 2003). However, it is uncertain if this will provide sufficient improvement for SGMs. Despite Norway being highly egalitarian, scoring high in rankings of LGBTQIA+ rights, and having progressive societal and political debates regarding these rights, the present findings suggest that existing interventions are not yet translated into lived realities for several SGM identities (Rainbow Europe, 2023; Sperre Saunes et al., 2020). This aligns with the contradiction between progressive values and plausible realities found by Røthing and Svendsen (2010), even as these were established more than a decade ago.

6.3. Strengths and Limitations

According to the available literature, including the most recently published reviews of the academic field, this thesis has provided the first national population-oriented mapping of

separate health outcomes across an extensive number of SOGIs (Bränström et al., 2024; Hatzenbuehler et al., 2024). The approach taken has allowed for an individual assessment of SOGIs, enabling the identification of health differences in an orderly fashion, as opposed to collective assessments that have ignored group differences (Asada & Hedemann, 2002; Cortina & Festy, 2014; Valfort, 2017). While this is the main contribution to existing research, it also adds to the growing body of research regarding several understudied SGM sub-groups. Several investigated identities, like non-binary, queer, pansexual, sexually fluid and asexual, have been particularly absent in quantitative approaches (Russell et al., 2023). Moreover, this thesis follows the recommendation of prominent scholars about continuously investigating inequality and identifying how and where it might be diminishing and becomes apparent (Risman, 2018). The contemporary data has provided new insights that also hold societal importance by reaffirming that inequalities may be present in societies perceived to achieve heightened egalitarianism (Olsen et al., 2020; Sperre Saunes et al., 2020).

The advancements made in this thesis are primarily facilitated by the data employed. However, it still held notable limitations, and thorough investigations of SGM health inequality remained challenging. Furthermore, while SAH is an appropriate and reliable predictor of population group health differences, there is still subjectivity to the measure (Jylhä, 2009). This could impact the nuances of the outcomes as respondents to the Norwegian Quality of Life Survey might be slightly dynamic in establishing their answers. Still, it was possible to conclude with lower health for SGMs, yet caution is required when considering the overall predicted outcomes as an extremity. Furthermore, certain analytical accommodations had to be made, which implicated the scale of health outcomes and assessment of varying moderation between identities. While the findings have identified the most disadvantaged SOGIs in terms of health, within-group variation remains largely unanswered. This could implicate the efficiency of interventions due to a lack of specificity in describing those with the most substantial shortfall (Harper & Lynch, 2017). However, since several factors were deemed more potent in predicting SAH than SOGI, these should be considered as they portray signs of health vulnerability and resilience.

Lastly, the theoretical foundation of expected health disparities was provided by the gender hierarchy, minority stress and structural stigma. However, the analysis did not directly measure these concepts besides sexuality or gender-based discrimination. As mentioned, recognising inequality depicted in the outcomes should not be conditional. Still, if social attitudes or norms were measured, the underlying issues would likely be better identified and

could thus be more efficiently interacted with (Hatzenbuehler & Link, 2014; Kitzinger, 1997).

6.4. Conclusion and Future Recommendations

This research has shown that contemporary Norwegian Sexual and Gender Minorities (SGMs) experience considerable health disparities compared to the majority identities at a national level. The SGM population is distinguishable from the cis-gender heterosexual population by socio-demographic characteristics as well as holding variations between minority identities. Moreover, the findings advance the field of study as they present a noticeable variation in health outcomes between Sexual Orientations and Gender Identities (SOGIs), reaffirming that they should not be considered homogenous. This implicates the findings of several existing studies that have clustered or ignored multiple SGM identities (Cortina & Festy, 2014; Valfort, 2017). These previous limitations were overcome using the Norwegian Quality of Life Survey, which holds unprecedented amounts of SOGIs. However, quantitatively analysing the SGM identities remained challenging due to imperfect data. Hence, more population-based datasets with representable SGM samples are highly anticipated for future research, and including SOGI identifiers in future surveys is recommended.

Furthermore, the disparities found were not predicted by identifying as an SGM alone, and further distinctions within the minority sub-groups are plausible. Therefore, future investigations should focus on identifying variations in other health influences within the SGM population, such as the number of close relationships that proved most determinantal in the present findings. This may then better identify those most vulnerable and ensure efficient interventions (Hatzenbuehler & Link, 2014; Kitzinger, 1997). Nevertheless, younger and less established SOGIs, like asexual, pansexual and non-binary, were predicted to have some of the lowest health outcomes. Hence, policymakers should ensure that these emerging identities are protected, even as more traditional identities like lesbian and gay were found to have improved health.

The findings further confirm that the SGM population remains vulnerable despite the Norwegian government and the European Union's efforts to ensure their equality (European Commission, 2020; Regjeringen.no, 2023). Moreover, previously found contradictions between the Norwegian progressive values and the perception of a favourable reality as an SGM remain unchanged as well (Røthing & Svendsen, 2010). This emphasises that policymakers should continue to address their issues, especially as they are also a targeted population, as was dramatically demonstrated by the Oslo Pride shooting in 2022 (NRK, 2022).

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Appendices

List of Appendices:

Appendix A – Research Data Management Plan

Data management plan made using the template available in the course content on Brightspace of the course "Master's Thesis Population Studies."

1. General	
1.1 Name & title of thesis	Broadening the Disparity Spectrum: The Health of Sexual and Gender Minorities in 2020s Norway
1.2 *(if applicable)* Organisation. Provide details on the organisation where the research takes place if this applies (in case of an internship).	N.A.

2 Data collection – the creation of data	
2.1. Which data formats or which sources are used in the project? For example: - theoretical research, using literature and publicly available resources - Survey Data - Field Data - Interviews	The research's theoretical section uses literature and publicly available resources. The literature is either publicly accessible or accessed through the library of the University of Groningen and Universitat Pompeu Fabra. The data employed (Norwegian Quality of Life Survey) is survey data, also publicly accessible following terms of use. The data management guidelines of the providing institution are followed, see https://sikt.no/en/data-management-plan.
2.2 Methods of data collection What method(s) do you use for the collection of data. (Tick all boxes that apply)	☐ Structured individual interviews ☐ Semi-structured individual interviews ☐ Structured group interviews ☐ Semi-structured group interviews ☐ Observations ☐ Survey(s) ☐ Experiment(s) in real life (interventions) ☒ Secondary analyses on existing data sets (if so: please also fill in 2.3) ☐ Public sources (e.g. University Library) ☐ Other (explain):
2.3. (If applicable): if you have selected 'Secondary analyses on existing datasets': who provides the data set?	☐ Data is supplied by the University of Groningen. ☒ Data have been supplied by an external party: the Norwegian Agency for Shared Services in Education and Research (SIKT)

3 Storage, Sharing and Archiving	
3.1 Where will the (raw) data be stored *during* research?	☐ X-drive of UG network ☐ Y-drive of UG network ☐ (Shared) UG Google Drive

	☐ Unishare ☒ Personal laptop or computer ☐ External devices (USB, harddisk, NAS) ☐ Other (explain):
3.2 Where are you planning to store / archive the data after you have finished your research? Please explain where and for how long. Also explain who has access to these data NB do not use a personal UG network or google drive for archiving data!	☐ X-drive of UG network ☐ Y-drive of UG network ☐ (Shared) UG Google Drive ☐ Unishare ☐ In a repository (i.e. DataverseNL) ☒ Other (explain): The data will remain stored on the personal laptop of the author. It will be deleted once the thesis is completed, awarded a passing grade and no further actions are needed or at the latest May 2nd 2026 per the data agreement.
3.3 Sharing of data With whom will you be sharing data during your research?	☐ University of Groningen ☐ Universities or other parties in Europe ☐ Universities or other parties outside Europe ☒ I will not be sharing data

4. Personal data	
4.1 Collecting personal data Will you be collecting personal data? If you are conducting research with personal data you have to comply to the General Data Privacy Regulation (GDPR). Please fill in the questions found in the appendix 3 on personal data.	No
If the answer to 4.1 is 'no', please skip the section below and proceed to section 5	
4.2 What kinds of categories of people are involved? Have you determined whether these people are vulnerable in any way (see FAQ)? If so, your supervisor will need to agree.	My research project involves: ☐ Adults (not vulnerable) ≥ 18 years ☐ Minors < 16 years ☐ Minors < 18 years ☐ Patients ☐ (other) vulnerable persons, namely…
4.3 Will participants be enlisted in the project without their knowledge and/or consent? (E.g., via covert observation of people in public places, or by using social media data.)	

4.4 Categories of personal data that are processed. Mention all types of data that you systematically collect and store. If you use particular kinds of software, then check what the software is doing as well. Of course, always ask yourself if you need all categories of data for your project.	☐ Name and address details ☐ Telephone number ☐ Email address ☐ Nationality ☐ IP-addresses and/or device type ☐ Job information ☐ Location data ☐ Race or ethnicity ☐ Political opinions ☐ Physical or mental health ☐ Information about a person's sex life or sexual orientation ☐ Religious or philosophical beliefs ☐ Membership of a trade union ☐ Biometric information ☐ Genetic information ☐ Other (please explain below):
4.5 Technical/organisational measures Select which of the following security measures are used to protect personal data.	☐ Pseudonymisation ☐ Anonymisation ☐ File encryption ☐ Encryption of storage ☐ Encryption of transport device ☐ Restricted access rights ☐ VPN ☐ Regularly scheduled backups ☐ Physical locks (rooms, drawers/file cabinets) ☐ None of the above ☐ Other (describe below):
4.6 Will any personal data be transferred to organisations within countries outside the European Economic Area (EU, Norway, Iceland and Liechtenstein)? If the research takes places in a country outside the EU/EEA, then please also indicate this.	

5 – Final comments	
Do you have any other information about the research data that was not addressed in this template that you think is useful to mention?	The data was identified and applied for through the survey bank portal of SIKT (https://sikt.no/tjenester/finn-

<table>
<tr><td></td><td>data/surveybanken). The research acknowledges that application was made possible due to the Population Research Centre (UG) being a recognised research entity by Eurostat (see: https://ec.europa.eu/eurostat/documents/203647/771732/Recognised-research-entities.pdf). The data agreement was signed by both the author of the research (Bob Langereis) and thesis supervisor form the University of Groningen, Tobias Vogt. Data agreement is available upon request if deemed necessary.</td></tr>
</table>

Appendix B – Operationalised measures and their variable specifications

Introduced in model	Variable group	Variable name	Original variable name in dataset	Transformation conditions	Final variable specification
Model 1	Health outcomes (Dependent variable)	Self-Assessed Health (SAH)	Hels1	N/A	1 – Very good (ref.) 2 – Good 3 – Neither (good) nor (poor) 4 – Poor 5 – Very poor
		SAH (binary)	Hels1	1 if Hels1 < 3 0 if Hels1 > 2	1 – Good 0 – Not good
		SAH (binary with different threshold)		1 if Hels1 < 4 0 if Hels1 > 3	1 – Not bad 0 – Bad
	SOGI (Independent variables)	Sexual Orientation[1]	Seksorient	"Lesbian" and "Gay" merged "Other" dropped.	1 – Heterosexual (ref.) 2 – Lesbian/Gay 3 – Bisexual 4 – Pansexual 5 – Queer 6 – Asexual 7 – Fluid
		Gender Identity[2]	kjoenn (register sex), Kjonnident (self identitfied) Juridisk (ever changed legal gender)	"non-cis" if Kjonnident ≠ kjoenn "non-cis" if Juridisk = 1 (yes) 0 if Kjonnident = 1 (man) 1 if Kjonnident = 1 (man) & non-cis 2 if Kjonnident = 2 (women) 3 if Kjonnident = 2 (woman) & non-cis 4 if Kjonnident = 3 (non-binary)	0 – Cis-man (ref.) 1 – Trans-man 2 – Cis-woman 3 – Trans-woman 4 – Non-binary
	Survey year	Year	aar	N/A	2022 (ref.)

					2023
Model 2	Personal characteristics	Age	alder	N/A	*continuous* (lowest value 18 = ref.)
		Gender[3]	Kjonnident	0 if Kjonnident = 1 (man) 1 if Kjonnident = 2 (women) 2 if Kjonnident = 3 (non-binary) 2 if Kjonnident = 4 (other)	0 – Men (ref.) 1 – Women 2 – Other
		Sexuality[4]	ikke_hetero	N/A	0 – Heterosexual (ref.) 1 – Non-heterosexual
		Partnership status	sivilstand (civil status), Gift (married or registered partnership), Kjaereste (partner)	4 if sivilstand == 1 4 if Kjaereste == 2 0 if sivilstand == 2 0 if sivilstand == 6 2 if sivilstand == 4 2 if sivilstand == 5 2 if sivilstand == 8 3 if sivilstand == 3 3 if sivilstand == 9 1 if Gift == 2 1 if Kjaereste == 1	0 – Registered Partner (ref.) 1 – Partnered 2 – Separated 3 – Remaining Partner 4 – Unpartnered
		Foreign born	innvbak (migration backround)	0 if innvnbak = 2 (Norwegian born, foreign born parents) 0 if innvbak = 3 (remaining population) 1 if innvbak = 1 (foreign born)	0 – Non-foreign born (ref.) 1 – Foreign born
		Employment	selvok (self-defined economical status)	0 if selvok = 1 (active professional) 0 if selvok = 3 (student & military) 0 if selvok = 4 (retired) 1 if selvok = 5 (incapacitated for work) 1 if selvok = 6 (unemployed) 1 if selvok = 9 (other)	0 – Employed (ref.) 1 – Unemployed

		Income quarter	kvart_int	Values reversed	0 – Highest income quarter (ref.) 1 – Third income quarter 2 – second income quarter 3 – Lowest income quarter
		Health symptoms	helseprob (health issues, lasting limting disability)	0 if helseprob = 2 (no) 1 if helseprob = 1 (yes)	0 – None reported (ref.) 1 – Reported physical 2 – Reported mental 3 – Reported both
Model 3	Environmental characteristics	Centrality	sentralitet	0 if sentralitet = 1 (highest centrality) 0 if sentralitet = 2 1 if sentralitet = 3 1 if sentralitet = 4 2 if sentralitet = 5 2 if sentralitet = 6 (lowest centrality)	0 – High centrality (ref.) 1 – Medium centrality 2 – Low centrality
		Number of close relationships	Naere	Values reversed	0 – 6 or more (ref.) 1 – 3 to 5 2 – 1 or 2 3 – None
		Discrimination[5]	Disk02 (gender) Disk09 (sexuality)	0 if Disk02/Disk09 = 2 (not reported) 1 if Disk02/Disk09 = 1 (reported)	0 – Not experienced (ref.) 1 – Experienced
		Discrimination[5]	Disk02 (gender) Disk09 (sexuality)	0 if Disk02/Disk09 = 2 (not reported) 1 if Disk02/Disk09 = 1 (reported)	0 – Not experienced (ref.) 1 – Experienced

Note: 1. Only used in sexual orientation (SO) model. 2. Only used in gender identity (GI) model. 3. Genders as included in SO model only. 4. Sexuality as included in GI model only. 5. In the SO model this is specified as sexuality-based discrimination, and in the GI model this is specified as gender-based discrimination. "(ref.)" indicates reference category. Prior to any variable transformation all "refusal" or "don't know" were specified as non-numeric values ("."). "N/A" in the transformation collum indicates that variable specification was unchanged. Source: Norwegian Quality of Life Survey 2022 and 2023.

Appendix C – Additions to Statistical Procedure

Descriptives incl. number of cases

Table A. Descriptive statistics across Sexual Orientations (including number of cases).

Indicator	Hetero.	Les./Gay	Bisex.	Pansex.	Queer	Asex.	Fluid	Total
SAH*								
Very good	5365	76	60	13	10	3	15	5542
	17.91	*16.74*	*9.10*	*8.78*	*13.16*	*4.29*	*13.16*	*17.60*
Good	15034	217	253	54	24	23	50	15655
	50.18	*47.80*	*38.39*	*36.49*	*31.58*	*32.86*	*43.86*	*49.73*
Neither nor	6183	96	179	36	18	18	31	6561
	20.64	*21.15*	*27.16*	*24.32*	*23.68*	*25.71*	*27.19*	*20.84*
Bad	2911	53	135	36	22	23	15	3195
	9.72	*11.67*	*20.49*	*24.32*	*28.95*	*32.86*	*13.16*	*10.15*
Very Bad	468	12	32	9	2	3	3	529
	1.56	*2.64*	*4.86*	*6.08*	*2.63*	*4.29*	*2.63*	*1.68*
Age	29961	454	659	148	76	70	114	31482
(mean)	49.51	42.34	33.70	32.24	33.05	40.57	38.45	48.90
Gender								
Man	14578	278	196	40	16	26	39	15173
	48.75	*61.78*	*30.48*	*28.57*	*22.86*	*37.68*	*35.78*	*48.35*
Woman	15305	161	434	81	40	34	64	16119
	51.18	*35.78*	*67.50*	*57.86*	*57.14*	*49.28*	*58.72*	*51.36*
Other	19	11	13	19	14	9	6	90
	0.06	*2.44*	*2.02*	*13.57*	*20.00*	*13.04*	*5.50*	*0.29*
Foreign born								
No	26573	381	576	126	67	57	88	27868
	88.69	*83.92*	*87.41*	*85.14*	*88.16*	*81.43*	*77.19*	*88.52*
Yes	3388	73	83	22	9	13	26	3614
	11.31	*16.08*	*12.59*	*14.86*	*11.84*	*18.57*	*22.81*	*11.48*
Employ. status								
Employed	27058	399	540	109	57	46	98	28307
	90.22	*87.89*	*81.94*	*73.65*	*75.00*	*64.79*	*85.96*	*89.83*
Unemployed	2933	55	119	39	19	25	16	3206
	9.78	*12.11*	*18.06*	*26.35*	*25.00*	*35.21*	*14.04*	*10.17*
Obj. Health								
Not reported	21877	321	396	76	43	36	74	22823
	73.26	*71.18*	*60.64*	*52.05*	*56.58*	*52.94*	*66.07*	*72.76*
Reported	7984	130	257	70	33	32	38	8544
	26.74	*28.82*	*39.36*	*47.95*	*43.42*	*47.06*	*33.93*	*27.24*
Partner. status								
Reg. partner	14072	107	108	21	6	8	29	14351
	46.99	*23.88*	*16.39*	*14.19*	*7.89*	*11.43*	*25.44*	*45.61*
Partnered	8633	145	275	72	29	10	38	9202
	28.83	*32.37*	*41.73*	*48.65*	*38.16*	*14.29*	*33.33*	*29.25*
Separated	1794	17	26	9	6	9	11	1872
	5.99	*3.79*	*3.95*	*6.08*	*7.89*	*12.86*	*9.65*	*5.95*
Remain. partner	724	4	5	2	0	1	0	736
	2.42	*0.89*	*0.76*	*1.35*	*0.00*	*1.43*	*0.00*	*2.34*
Unpartnered	4725	175	245	44	35	42	36	5302
	15.78	*39.06*	*37.18*	*29.73*	*46.05*	*60.00*	*31.58*	*16.85*
Income quart.								
Highest	10070	121	120	19	13	8	27	10378
	33.61	*26.65*	*18.21*	*12.84*	*17.11*	*11.27*	*23.68*	*32.96*
Third	8264	132	139	27	9	16	23	8609
	27.58	*29.07*	*21.09*	*18.24*	*11.84*	*22.54*	*20.18*	*27.35*
Second	6430	97	143	39	25	20	23	6777
	21.46	*21.37*	*21.70*	*26.35*	*32.89*	*28.17*	*20.18*	*21.53*
Lowest	5197	104	257	63	29	27	41	5718
	17.35	*22.91*	*39.00*	*42.57*	*38.16*	*38.03*	*35.96*	*18.16*
Education								
Higher (>4 yrs)	4449	86	65	15	12	8	17	4652
	14.85	*18.94*	*9.86*	*10.14*	*15.79*	*11.43*	*14.91*	*14.78*
Higher (1-4 yrs)	9710	141	187	44	20	26	32	10160
	32.41	*31.06*	*28.38*	*29.73*	*26.32*	*37.14*	*28.07*	*32.27*
Secondary	11489	144	235	49	26	22	38	12003
	38.35	*31.72*	*35.66*	*33.11*	*34.21*	*31.43*	*33.33*	*38.13*
Primary	3707	62	145	36	15	13	22	4000
	12.37	*13.66*	*22.00*	*24.32*	*19.74*	*18.57*	*19.30*	*12.71*
None (specified)	606	21	27	4	3	1	5	667
	2.02	*4.63*	*4.10*	*2.70*	*3.95*	*1.43*	*4.39*	*2.12*
Centrality								
High	14088	285	353	81	49	44	55	14955
	47.06	*62.91*	*53.73*	*54.73*	*64.47*	*62.86*	*48.25*	*47.55*
Medium	12195	134	246	53	19	20	43	12710

	40.74	*29.58*	*37.44*	*35.81*	*25.00*	*28.57*	*37.72*	*40.41*
Low	3652	34	58	14	8	6	16	3788
	12.20	*7.51*	*8.83*	*9.46*	*10.53*	*8.57*	*14.04*	*12.14*
N/o close rel.								
6 or more	10706	133	162	32	22	12	30	11097
	35.76	*29.30*	*24.58*	*21.62*	*28.95*	*17.14*	*26.32*	*35.27*
3 to 5	12969	195	292	62	38	21	50	13618
	43.29	*42.95*	*44.31*	*41.89*	*50.00*	*30.00*	*43.86*	*43.29*
1 or 2	5688	113	182	47	14	29	30	6103
	19.00	*24.89*	*27.62*	*31.76*	*18.42*	*41.43*	*26.32*	*19.40*
None	586	13	23	7	2	8	4	643
	1.96	*2.86*	*3.49*	*4.73*	*2.63*	*11.43*	*3.51*	*2.04*
Discrimination								
Not exp.	29685	358	586	110	57	64	104	30965
	99.19	*79.38*	*89.06*	*74.83*	*75.00*	*91.43*	*91.23*	*98.47*
Experienced	243	93	72	37	19	6	10	480
	0.81	*20.62*	*10.94*	*25.17*	*25.00*	*8.57*	*8.77*	*1.53*
Year								
2022	13765	210	294	75	39	31	61	14475
	45.94	*46.26*	*44.61*	*50.68*	*51.32*	*44.29*	*53.51*	*45.98*
2023	16196	244	365	73	37	39	53	17007
	54.06	*53.74*	*55.39*	*49.32*	*48.68*	*55.71*	*46.49*	*54.02*
Total *n*	**29961**	**454**	**659**	**148**	**76**	**70**	**114**	**31482**

Note: Includes all cases regardless of missing information on other variables. First row is percentages, second is number of cases. Source: Norwegian Quality of Life Survey 2022 and 203, own calculations.

Table B. Descriptive statistics across Gender Identities. (including number of cases).

Indicator		Cis-men	Trans-men	Cis-women	Trans-women	Non-binary	Total
*SAH**							
	Very good	2755	16	2943	21	10	5745
		17.53	*14.29*	*17.49*	*19.63*	*12.50*	*17.49*
	Good	7860	45	8293	42	17	16257
		50.02	*40.18*	*49.28*	*39.25*	*21.25*	*49.50*
	Neither nor	3426	28	3416	23	27	6920
		21.80	*25.00*	*20.30*	*21.50*	*33.75*	*21.07*
	Bad	1423	19	1893	12	24	3371
		9.06	*16.96*	*11.25*	*11.21*	*30.00*	*10.26*
	Very Bad	250	4	285	9	2	550
		1.59	*3.57*	*1.69*	*8.41*	*2.50*	*1.67*
Age		15714	112	1830	107	80	32843
	(mean)	*49.82*	*45*	*48.17*	*46.03*	*32.23*	*48.91*
Sexuality							
	Heterosexual	15127	87	16027	88	19	31348
		96.26	*77.68*	*95.23*	*82.24*	*23.75*	*95.45*
	Non-Hetero.	587	25	803	19	61	1495
		3.74	*22.32*	*4.77*	*17.76*	*76.25*	*4.55*
Foreign born							
	No	13680	65	14725	54	67	28591
		87.06	*58.04*	*87.49*	*50.47*	*83.75*	*87.05*
	Yes	2034	47	2105	53	13	4252
		12.94	*41.96*	*12.51*	*49.53*	*16.25*	*12.95*
Employment							
	Employed	14448	89	14679	87	58	29361
		91.94	*79.46*	*87.22*	*81.31*	*72.50*	*89.40*
	Unemployed	1266	23	2151	20	22	3482
		8.06	*20.54*	*12.78*	*18.69*	*27.50*	*10.60*
Obj. Health							
	Not reported	12135	68	11471	78	40	23792
		77.50	*62.39*	*68.45*	*74.29*	*50.63*	*72.74*
	Reported	3523	41	5287	27	39	8917
		22.50	*37.61*	*31.55*	*25.71*	*49.37*	*27.26*
Income quartile							
	Highest quarter	5372	20	5151	19	13	10575
		34.19	*17.86*	*30.61*	*17.76*	*16.25*	*32.20*
	Third quarter	4365	25	4472	15	13	8890
		27.78	*22.32*	*26.57*	*14.02*	*16.25*	*27.07*
	Second quarter	3301	16	3778	28	21	7144
		21.01	*14.29*	*22.45*	*26.17*	*26.25*	*21.75*
	Lowest quarter	2676	51	3429	45	33	6234
		17.03	*45.54*	*20.37*	*42.06*	*41.25*	*18.98*
Education							
	Higher (>4 yrs)	2335	11	2389	5	9	4749
		14.86	*9.82*	*14.19*	*4.67*	*11.25*	*14.46*
	Higher (1-4 yrs)	3922	20	6428	21	21	10412
		24.96	*17.86*	*38.19*	*19.63*	*26.25*	*31.70*
	Secondary	6849	37	5563	43	27	12519
		43.59	*33.04*	*33.05*	*40.19*	*33.75*	*38.12*

X

Primary	2185	35	2129	24	19	4392
	13.90	*31.25*	*12.65*	*22.43*	*23.75*	*13.37*
None (specified)	423	9	321	14	4	771
	2.69	*8.04*	*1.91*	*13.08*	*5.00*	*2.35*
Partner. Status						
Reg. Partner	7564	46	7355	44	10	15019
	48.16	*41.82*	*43.72*	*41.51*	*12.50*	*45.76*
Partnered	4427	31	4951	31	27	9467
	28.19	*28.18*	*29.43*	*29.25*	*33.75*	*28.84*
Separated	704	8	1245	8	4	1969
	4.48	*7.27*	*7.40*	*7.55*	*5.00*	*6.00*
Remain. Partner	177	5	611	1	2	796
	1.13	*4.55*	*3.63*	*0.94*	*2.50*	*2.43*
Unpartnered	2833	20	2661	22	37	5573
	18.04	*18.18*	*15.82*	*20.75*	*46.25*	*16.98*
Centrality						
High	7350	56	8084	45	45	15580
	46.79	*50.45*	*48.09*	*42.86*	*56.25*	*47.48*
Medium	6437	45	6721	40	22	13265
	40.98	*40.54*	*39.98*	*38.10*	*27.50*	*40.42*
Low	1922	10	2004	20	13	3969
	12.24	*9.01*	*11.92*	*19.05*	*16.25*	*12.10*
N/o close rel.						
6 or more	4839	14	6539	20	15	11427
	30.83	*12.61*	*38.87*	*18.69*	*18.75*	*34.82*
3 to 5	6969	43	7020	34	24	14090
	44.40	*38.74*	*41.73*	*31.78*	*30.00*	*42.94*
1 or 2	3450	44	2994	35	33	6556
	21.98	*39.64*	*17.80*	*32.71*	*41.25*	*19.98*
None	439	10	268	18	8	743
	2.80	*9.01*	*1.59*	*16.82*	*10.00*	*2.26*
Discrimination						
Not exp.	14965	92	14686	86	39	29868
	95.44	*84.40*	*87.48*	*81.13*	*48.75*	*91.17*
Experienced	715	17	2101	20	41	2894
	4.56	*15.60*	*12.52*	*18.87*	*51.25*	*8.83*
Year						
2022	7191	51	7714	49	34	15039
	45.76	*45.54*	*45.83*	*45.79*	*42.50*	*45.79*
2023	8523	61	9116	58	46	17804
	54.24	*54.46*	*54.17*	*54.21*	*57.50*	*54.21*
Total *n*	**15714**	**112**	**16830**	**107**	**80**	**32843**

Note: Includes all cases regardless of missing information on other variables. First row is percentages, second is number of cases. Source: Norwegian Quality of Life Survey 2022 and 203, own calculations.

Assumption tests

As seen in table C, sexual orientation actually passes the brant test, yet the linktest (Table E) suggest that the model does not provide sufficient model fit.

Table C. Brant test of ordered logistic regression predicting SAH (5 cat.) over SOGI

	Sexual Orientation			Gender Identity		
Variables	Chi-square	p > chi-square	Degrees of freedom	Chi-square	p > chi-square	Degrees of freedom
All	372.460	0.000	39	386.230	0.000	39
Sexual orientation	2.810	0.422	3	-	-	-
Gender identity	-	-	-	12.140	0.007	3
Year	6.050	0.109	3	7.340	0.062	3
Age	45.460	0.000	3	34.330	0.000	3
Gender	12.480	0.006	3	-	-	-
Non-heterosexual	-	-	-	0.850	0.838	3
Foreign-born	10.720	0.013	3	6.290	0.098	3
Employment status	48.210	0.000	3	60.030	0.000	3
Objective health	91.950	0.000	3	91.080	0.000	3
Partnership status	20.880	0.000	3	1.850	0.605	3
Income	0.890	0.828	3	18.420	0.000	3
Education	13.520	0.004	3	21.000	0.000	3
Centrality	13.010	0.005	3	13.300	0.004	3
N/o close relationships	15.980	0.001	3	15.570	0.001	3
Discrimination	14.050	0.003	3	9.200	0.027	3

Note: A significant test statistic indicates violation of the proportional assumption. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table D. Brant test of ordered logistic regression predicting SAH (3 cat.) over SOGI

	Sexual Orientation			Gender Identity		
Variables	Chi-square	p > chi-square	Degrees of freedom	Chi-square	p > chi-square	Degrees of freedom
All	145.170	0.000	13	148.030	0.000	13
Sexual orientation	0.020	0.900	1	-	-	-
Gender identity	-	-	-	5.870	0.015	1
Year	4.170	0.041	1	5.970	0.015	1
Age	18.790	0.000	1	12.980	0.000	1
Gender	7.380	0.007	1	-	-	-
Non-heterosexual	-	-	-	0.330	0.566	1
Foreign-born	0.020	0.896	1	0.160	0.687	1
Employment status	9.940	0.002	1	13.560	0.000	1
Objective health	66.190	0.000	1	65.330	0.000	1
Partnership status	0.010	0.941	1	0.320	0.572	1
Income	0.210	0.650	1	12.190	0.000	1
Education	10.690	0.001	1	0.010	0.912	1
Centrality	3.840	0.050	1	3.760	0.053	1
N/o close relationships	0.640	0.423	1	0.490	0.485	1
Discrimination	3.910	0.048	1	2.180	0.140	1

Note: A significant test statistic indicates violation of the proportional assumption. Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table E. Link test of generalised ordered logistic regression predicting SAH (5 cat.) over sexual orientation

Values	Coeff.	St. error	z-score	P>z
Very bad				
_hat	0.797	0.152	5.240	0.000
_hatsq	0.030	0.022	1.390	0.164
Constant	0.295	0.245	1.200	0.228
Bad				
_hat	0.184	0.094	1.960	0.050
_hatsq	0.127	0.012	10.500	0.000
Constant	-1.323	0.173	-7.650	0.000
Neither nor				
_hat	0.745	0.095	7.800	0.000
_hatsq	0.034	0.011	3.210	0.001
Constant	-3.697	0.206	-17.990	0.000
Good				
_hat	1.686	0.189	8.940	0.000
_hatsq	-0.082	0.019	-4.400	0.000
Constant	-8.099	0.471	-17.210	0.000

Note: The desired outcomes are a significant "_hat" (indicating a correctly specified model), and an insignificant "_hatsq" (indicating no important variables omitted).
Generalized Ordered Logit Estimates: Number of obs = 31,166, LR chi2(8) = 11112.78, Prob > chi2 = 0.0000, Pseudo R2 = 0.1394, Log likelihood = -34301.599.
Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Table F. Link test of Binary Logistic Regression predicting SAH (binary) over SOGI.

Values	Sexual Orientation				Gender Identity			
	Coeff.	St. error	z-score	P>z	Coeff.	St. error	z-score	P>z
_hat	0.989	0.014	70.920	0.000	0.991	0.014	73.150	0.000
_hatsq	0.016	0.010	1.600	0.109	0.013	0.010	1.320	0.186
Constant	-0.022	0.021	-1.020	0.308	-0.018	0.021	-0.850	0.395

Note: The desired outcomes are a significant "_hat" (indicating a correctly specified model), and an insignificant "_hatsq" (indicating no important variables omitted). SOGI, Sexual Orientation and Gender Identity.
Source: Norwegian Quality of Life Survey 2022 and 2023, own calculations.

Appendix D – Additional and Complete Regression Tables

Table G. Binary logistic regression predicting not bad SAH of sexual orientations (complete table).

Variables	Not-bad SAH (1) OR	(SE)	Not-bad SAH (2) OR	(SE)	Not-bad SAH (3) OR	(SE)	Not-bad SAH (4) OR	(SE)
Sexual orientation *(Ref. Heterosexual)*								
Lesbian/Gay	0.761**	(0.103)	0.969	(0.160)	1.071	(0.182)	0.611	(0.207)
Bisexual	0.375***	(0.034)	0.548***	(0.064)	0.586***	(0.070)	0.412***	(0.123)
Pansexual	0.291***	(0.052)	0.529***	(0.124)	0.603**	(0.146)	0.183***	(0.121)
Queer	0.275***	(0.068)	0.404***	(0.126)	0.416***	(0.132)	0.854	(0.649)
Asexual	0.215***	(0.053)	0.491**	(0.158)	0.564*	(0.182)	0.303	(0.301)
Fluid	0.677	(0.174)	0.936	(0.296)	1.019	(0.328)	0.560	(0.383)
Age			1.003*	(0.0015)	1.004***	(0.0015)	1.004***	(0.00151)
Gender *(Ref. Man)*								
Woman			1.150***	(0.049)	1.064	(0.046)	1.062	(0.046)
Other			0.988	(0.297)	1.158	(0.367)	1.154	(0.376)
Foreign Born			0.918	(0.065)	1.057	(0.077)	1.057	(0.077)
Unemployed			0.300***	(0.0149)	0.312***	(0.0156)	0.310***	(0.0156)
Impairmed			0.0838***	(0.00392)	0.0859***	(0.00405)	0.0857***	(0.00405)
Partnership status *(Ref. Reg.Partner)*								
Partnered			0.896**	(0.0493)	0.968	(0.0540)	0.970	(0.0542)
Separated			0.719***	(0.0568)	0.832**	(0.0671)	0.838**	(0.0677)
Remain. partner			0.764**	(0.0994)	0.838	(0.111)	0.848	(0.112)
Unpartnered			0.624***	(0.0402)	0.713***	(0.0469)	0.717***	(0.0472)
Income quarter *(Ref. High)*								
Third			0.800***	(0.0470)	0.823***	(0.0489)	0.807***	(0.0492)
Second			0.688***	(0.0412)	0.717***	(0.0434)	0.702***	(0.0438)
Lowest			0.698***	(0.0452)	0.738***	(0.0485)	0.707***	(0.0481)
Les./Gay # Income								
# Third							1.636	(0.745)
# Second							1.923	(0.908)
# Lowest							2.750**	(1.255)
Bisex. # Income								
# Third							1.305	(0.512)
# Second							1.432	(0.537)
# Lowest							1.684	(0.586)
Pansex. # Income								
# Third							4.365	(3.831)
# Second							2.263	(1.808)
# Lowest							5.265**	(3.748)
Queer # Income								
# Third							1.078	(1.660)
# Second							0.649	(0.584)
# Lowest							0.267	(0.227)
Asex. # Income								
# Third							3.693	(4.496)
# Second							1.522	(1.744)
# Lowest							1.742	(1.936)
Fluid # Income								
# Third							1.047	(0.987)
# Second							4.552	(5.973)

	OR	(SE)	OR	(SE)	OR	(SE)	OR	(SE)
# Lowest							2.417	(2.046)
Education								
(Ref. Higher > 4yrs.)								
Higher (1-4 yrs.)			0.769***	(0.0610)	0.771***	(0.0620)	0.774***	(0.0623)
Secondary			0.625***	(0.0482)	0.647***	(0.0508)	0.649***	(0.0510)
Primary			0.548***	(0.0470)	0.606***	(0.0532)	0.609***	(0.0535)
None (specified)			0.965	(0.175)	1.014	(0.185)	1.011	(0.185)
Centrality *(Ref. High)*								
Medium					1.008	(0.0455)	1.006	(0.0455)
Low					1.042	(0.0692)	1.041	(0.0691)
N/o close friends								
(Ref. 6 or more)								
3 to 5					0.745***	(0.0389)	0.744***	(0.0389)
1 or 2					0.440***	(0.0254)	0.441***	(0.0255)
None					0.283***	(0.0333)	0.283***	(0.0334)
Discriminated					0.690**	(0.100)	0.682***	(0.0992)
Year 2023	0.973	(0.0342)	1.156***	(0.0476)	1.145***	(0.0477)	1.144***	(0.0477)
(Ref. 2022)								
Constant	1.199e+25	(8.535e+26)	1.8e-126***	(1.5e-124)	1.1e-117***	(9.6e-116)	5.6e-117***	(4.7e-115)
Observations	31,482		31,249		31,166		31,166	

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table H. Binary logistic regression predicting SAH of sexual orientations (with weights).

	Good SAH (1)		Good SAH (2)		Good SAH (3)		Good SAH (4)	
Variables	*OR*	*(SE)*	*OR*	*(SE)*	*OR*	*(SE)*	*OR*	*(SE)*
Sexual orientation								
(Ref. Heterosexual)								
Lesbian/Gay	0.879	(0.0924)	1.096	(0.150)	1.165	(0.162)	0.840	(0.221)
Bisexual	0.412***	(0.0345)	0.500***	(0.0524)	0.526***	(0.0558)	0.608**	(0.152)
Pansexual	0.430***	(0.0755)	0.751	(0.170)	0.801	(0.189)	0.909	(0.546)
Queer	0.383***	(0.0930)	0.525**	(0.154)	0.495**	(0.149)	1.249	(1.076)
Asexual	0.298***	(0.0790)	0.530**	(0.157)	0.625	(0.194)	0.584	(0.407)
Fluid	0.627**	(0.126)	0.827	(0.215)	0.871	(0.231)	0.629	(0.349)
Age			0.997**	(0.00107)	0.999	(0.00109)	0.999	(0.00109)
Gender								
(Ref. Man)								
Woman			1.240***	(0.0392)	1.168***	(0.0376)	1.169***	(0.0376)
Other			0.842	(0.321)	0.856	(0.344)	0.840	(0.343)
Foreign Born			0.911*	(0.0482)	1.049	(0.0567)	1.049	(0.0566)
Unemployed			0.380***	(0.0195)	0.395***	(0.0206)	0.394***	(0.0206)
Impairmed			0.122***	(0.00413)	0.124***	(0.00424)	0.123***	(0.00424)
Partnership status								
(Ref. Reg.Partner)								
Partnered			0.933*	(0.0372)	1.005	(0.0405)	1.004	(0.0405)
Separated			0.790***	(0.0508)	0.901	(0.0593)	0.899	(0.0592)
Remain. partner			0.750***	(0.0765)	0.820*	(0.0853)	0.821*	(0.0854)
Unpartnered			0.651***	(0.0319)	0.732***	(0.0365)	0.730***	(0.0365)

	(1)		(2)		(3)		(4)	
			*		*		*	
Income quarter (Ref. High)								
Third			0.839***	(0.0335)	0.862***	(0.0348)	0.865***	(0.0355)
Second			0.726***	(0.0309)	0.753***	(0.0325)	0.748***	(0.0329)
Lowest			0.733***	(0.0352)	0.768***	(0.0375)	0.767***	(0.0385)
Les./Gay # Income							0.998	(0.344)
# Third							2.152**	(0.814)
# Second							1.695	(0.658)
# Lowest								
Bisex. # Income							1.006	(0.325)
# Third							0.845	(0.282)
# Second							0.768	(0.237)
# Lowest								
Pansex. # Income							0.560	(0.459)
# Third							0.684	(0.523)
# Second							1.135	(0.780)
# Lowest								
Queer # Income							0.617	(0.777)
# Third							0.284	(0.275)
# Second							0.347	(0.343)
# Lowest								
Asex. # Income							0.760	(0.742)
# Third							0.794	(0.708)
# Second							1.582	(1.382)
# Lowest								
Fluid # Income							1.115	(0.925)
# Third							3.574	(3.122)
# Second							1.109	(0.774)
# Lowest								
Education (Ref. Higher > 4yrs.)								
Higher (1-4 yrs.)			0.729***	(0.0383)	0.728***	(0.0388)	0.730***	(0.0388)
Secondary			0.519***	(0.0265)	0.541***	(0.0282)	0.542***	(0.0282)
Primary			0.444***	(0.0269)	0.490***	(0.0303)	0.491***	(0.0304)
None (specified)			0.698***	(0.0830)	0.734***	(0.0888)	0.734***	(0.0889)
Centrality (Ref. High)								
Medium					0.957	(0.0323)	0.956	(0.0324)
Low					0.949	(0.0467)	0.948	(0.0468)
N/o close friends (Ref. 6 or more)								
3 to 5					0.655***	(0.0238)	0.655***	(0.0238)
1 or 2					0.411***	(0.0181)	0.410***	(0.0182)
None					0.341***	(0.0360)	0.341***	(0.0361)
Discriminated					0.920	(0.130)	0.913	(0.128)
Year 2023 (Ref. 2022)	0.941**	(0.0245)	1.045	(0.0320)	1.044	(0.0324)	1.045	(0.0324)

Constant	4.446e+53*	(2.344e+5 5)*	1.04e-38	(6.45e-37)	1.55e-37	(9.74e-36)	5.05e-38	(3.17e-36)
Observations	31,482		31,249		31,166		31,166	

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table I. Binary logistic regression predicting not bad SAH of gender identities

Variables	Not bad SAH (1) OR	(SE)	Not bad SAH (2) OR	(SE)	Not bad SAH (3) OR	(SE)
Gender *(Ref. Cis-man)*						
Trans-man	0.461***	(0.109)	0.895	(0.259)	1.025	(0.308)
Cis-woman	0.802***	(0.028)	1.152***	(0.0479)	1.100**	(0.0470)
Trans-woman	0.488***	(0.119)	0.562*	(0.167)	0.634	(0.187)
Non-binary	0.248***	(0.0595)	0.799	(0.243)	1.025	(0.319)
Age			1.004**	(0.00144)	1.003**	(0.00149)
Non-Heterosexual			0.658***	(0.0542)	0.693***	(0.0581)
Foreign born			0.879**	(0.0568)	1.026	(0.0684)
Unemployed			0.306***	(0.0146)	0.315***	(0.0153)
Impairment			0.0836***	(0.00379)	0.0866***	(0.00397)
Partnership status *(Ref. Reg. Partner)*						
Partnered			0.915*	(0.0490)	0.984	(0.0536)
Separated			0.725***	(0.0555)	0.837**	(0.0654)
Remain. partner			0.755**	(0.0942)	0.847	(0.107)
Unpartnered			0.638***	(0.0397)	0.730***	(0.0464)
Income quarter *(Ref. High)*						
Third			0.802***	(0.0463)	0.822***	(0.0480)
Second			0.688***	(0.0403)	0.719***	(0.0426)
Lowest			0.694***	(0.0435)	0.736***	(0.0469)
Education *(Ref. Higher >4 yrs.)*						
Higher (1-4 yrs.)			0.637***	(0.0478)	0.656***	(0.0502)
Secondary			0.564***	(0.0469)	0.617***	(0.0525)
Primary			1.008	(0.168)	1.010	(0.171)
None (specified)						
Centrality *(Ref. High)*						
Medium					0.998	(0.0438)
Low					1.033	(0.0668)
N/o close friends *(Ref. 6 or more)*						
3 to 5					0.753***	(0.0385)
1 or 2					0.454***	(0.0255)
None					0.280***	(0.0309)
Discriminated					0.707***	(0.0457)
Year 2023 *(Ref. 2022)*	0.979	(0.0335)	1.159***	(0.0464)	1.156***	(0.0468)
Constant	2.820e+19	(1.952e+21)	6.1e-129***	(5.0e-127)	2.8e-126***	(2.3e-124)
Observations	32,843		32,690		32,561	

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table J. Binary logistic regression predicting SAH of gender identities with weights.

Variables	Good SAH (1) OR	(SE)	Good SAH (2) OR	(SE)	Good SAH (3) OR	(SE)
Gender *(Ref. Cis-man)*						
Trans-man	0.546***	(0.112)	0.914	(0.241)	1.087	(0.306)

	(1)		(2)		(3)	
Cis-woman	0.916***	(0.0234)	1.218***	(0.0377)	1.175***	(0.0373)
Trans-woman	0.766	(0.161)	0.995	(0.244)	1.140	(0.269)
Non-binary	0.283***	(0.0709)	0.643	(0.211)	0.763	(0.270)
Age			0.998*	(0.00104)	0.999	(0.00108)
Non-Heterosexual			0.691***	(0.0490)	0.720***	(0.0522)
Foreign born			0.903**	(0.0441)	1.031	(0.0519)
Unemployed			0.392***	(0.0192)	0.407***	(0.0202)
Impaired			0.121***	(0.00398)	0.123***	(0.00413)
Partnership status						
(Ref. Reg. Partner)						
Partnered			0.949	(0.0371)	1.027	(0.0407)
Separated			0.824***	(0.0516)	0.938	(0.0602)
Remain. partner			0.737***	(0.0714)	0.810**	(0.0794)
Unpartnered			0.667***	(0.0315)	0.753***	(0.0364)
Income quarter						
(Ref. High)						
Third			0.833***	(0.0328)	0.859***	(0.0341)
Second			0.728***	(0.0304)	0.760***	(0.0322)
Lowest			0.730***	(0.0340)	0.773***	(0.0366)
Education						
(Ref. Higher >4yrs.)						
Higher (1-4 yrs.)			0.749***	(0.0387)	0.746***	(0.0391)
Secondary			0.526***	(0.0264)	0.545***	(0.0280)
Primary			0.455***	(0.0267)	0.494***	(0.0298)
None (specified)			0.725***	(0.0795)	0.746***	(0.0832)
Centrality						
(Ref. High)						
Medium					0.955	(0.0316)
Low					0.945	(0.0454)
N/o close friends						
(Ref. 6 or more)						
3 to 5					0.652***	(0.0233)
1 or 2					0.419***	(0.0180)
None					0.347***	(0.0338)
Discriminated					0.756***	(0.0415)
Year 2023	0.943**	(0.0240)	1.046	(0.0312)	1.043	(0.0315)
(Ref. 2022)						
Constant	7.704e+51**	(3.961e+53)	3.82e-39	(2.31e-37)	2.94e-36	(1.80e-34)
Observations	32,843		32,690		32,561	

Note: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1