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Sex Surveys in Europe: Reflections on over Four Decades of Sexual Behavior and Sexual Health Surveillance

Hanneke de Graaf[a], Kirstin Mitchell[b], Soazig Clifton[c], Maria Fernanda Lara[d], Alexis Dewaele[e], Joke Dupont[e], Katerina Klapilova[f], Gunta Lazdāne[g], Peer Briken[h], Bente Træen[i], Nathalie Bajos[j], Desiree Ljungcrantz[k], and Osmo Kontula[l]

[a]National Programmes, Rutgers, Dutch Centre of Expertise on Sexual and Reproductive Health; [b]School of Health and Wellbeing, University of Glasgow; [c]Centre for Health at NatCen, the Institute for Global Health at University College London; [d]Departamento de Especialidades Quirúrgicas, Bioquímica, Ginecología y Obstetrician, Universidad de Málaga; [e]Faculty of Psychology and Educational Sciences, Ghent University; [f]National Institute of Mental Health, Klecany, and Faculty of Humanities, Charles University; [g]Institute of Public Health, Rīga Stradiņš University; [h]Institute for Sex Research, Sexual Medicine, and Forensic Psychiatry, University Centre Hamburg-Eppendorf; [i]Faculty of Social Sciences, Department of Psychology, University of Oslo; [j]IRIS U997, Institut National de la Santé et de la Recherche Médicale (INSERM); [k]Unit for Sexual Health and HIV prevention, The Public Health Agency of Sweden; [l]Population Research Institute, Family Federation of Finland

ABSTRACT

Sexual expression is fundamental to human existence and an important topic of enquiry in its own right. Understanding sexual behavior is also essential to establish effective sexual health prevention activities (e.g., education), services and policies, and to assess the progress of policies and action plans. Questions on sexual health are rarely included in general health surveys, and therefore dedicated population studies are required. Many countries lack both funding and sociopolitical support to conduct such surveys. A tradition of periodic population sexual health surveys exists in Europe but the methods used (e.g., in questionnaire construction, recruiting methods or interview format) vary from one survey to another. This is because the researchers within each country are confronted with conceptual, methodological, sociocultural and budgetary challenges, for which they find different solutions. These differences limit comparison across countries and pooling of estimates, but the variation in approaches provides a rich source of learning on population survey research. In this review, survey leads from 11 European countries discuss how their surveys evolved during the past four decades in response to sociohistorical and political context, and the challenges they encountered. The review discusses the solutions they identified and shows that it is possible to create well designed surveys which collect high quality data on a range of aspects of sexual health, despite the sensitivity of the topic. Herewith, we hope to support the research community in their perennial quest for political support and funding, and ongoing drive to advance methodology in future national sex surveys.

Introduction

Sexual expression is fundamental to human existence and an important topic of scientific enquiry. Monitoring sexual behavior and attitudes and sexual health outcomes is essential to establish effective prevention activities and policies, to adapt services to population needs, to inform sex education curricula, to promote sexual wellbeing and to assess the progress of policies and plans of action (World Health Organization [WHO], 2016). Despite its private nature, sexual behavior has profound public health consequences, including Human Immunodeficiency Virus (HIV)/sexually transmitted infections (STIs) and unplanned pregnancy, and is connected to sexual wellbeing and (mental) health (Field et al., 2013; Gianotten, 2021; Johnson et al., 2001). Furthermore, sexual expression is integrally related to the position of men and women and sexual and gender minorities, as well as socioeconomic disadvantage and inequality (Higgins et al., 2022). The relevance of sexual health to population wellbeing and need for analysis of these concepts and trends thus cannot be underestimated.

Little information about sexuality can be obtained from routinely collected data (i.e., data collected for purposes other than research, e.g., health records or disease registries), largely because questions about sex are rarely asked. Therefore, many European countries conduct periodical sexual health surveys, using population based samples. Inventories of the scientific and "grey" literature suggests that population based adult sexual health surveys have been conducted in more than 30 European countries (Matthiesen et al., 2017). Most of these studies were initiated because of public health challenges, such as the HIV/AIDS epidemic and unintended pregnancies in the 80s and 90s. Over the decades since these surveys began, they have provided a rigorous evidence base for sexual and reproductive health policies, education, and interventions.

The methods used (e.g., in questionnaire construction, recruiting methods or interview format) within these countries are very different. This is because research teams in each setting are confronted with challenges, for which they find different solutions. First of all, sexual health is a multidimensional concept and

CONTACT Hanneke de Graaf h.degraaf@rutgers.nl National Programmes, Rutgers, Dutch Centre of Expertise on Sexual and Reproductive Health, P.O. Box 9022, 3506 GA Utrecht, The Netherlands

therefore difficult to capture and measure. The WHO acknowledges the physical, emotional, mental and social components of sexual health, and not only the absence of negative components of sexual health (disease, dysfunction or violence) but also the presence of positive aspects (pleasurable and safe sexual experiences; WHO, 2006). Applying such a comprehensive definition of sexual health does not necessarily help decide which key indicators to include in sexual health surveys. Across countries and among experts there is ongoing discussion about what sexual health dimensions should be prioritized in terms of research and policy. A recent Delphi study to establish consensus on key topics among European sexual health experts found that topics such as sexual violence were widely viewed as important, whereas issues such as asexuality and paraphilias were ranked as lower priority (Dupont et al., 2022). In addition, the selection of priority topics reflects the needs of the population, important stakeholders (e.g., policy makers and health professionals), and particular vulnerable populations (e.g., ethnic and sexual minorities). In addition to these conceptual issues, methodological and sociocultural challenges give rise to differences across European countries, not only in questionnaire construction, but also in the methods of recruitment and interview format. Budgetary constraints also play a role, for example, in decisions about whether to recruit a probability sample or to use Computer Assisted Personal Interviewing (CAPI, a face to face interview in which the interviewer uses an electronic device to collect the answers). This limits the possibilities for comparison of data across surveys.

In the past, several collaborations have attempted to compare empirical data and to achieve more cross-European consistency in methods. In the early 1990s, eleven European countries worked together to compare the data of sixteen surveys on sexual behavior and HIV/AIDS prevention (Hubert et al., 2022). It was the first time that such systematic comparisons had been undertaken in Europe, and the first time that these large methodological differences across surveys became apparent. Another collaboration began in 1994, with the aim of designing and promoting a common survey protocol for surveys on sexual behavior and HIV/AIDS prevention (the new encounter module (NEM)). Nine European countries partly or fully included this NEM module in their national sex surveys between 1997–2001, which provided a basis for European comparisons (e.g., Bajos et al., 2003; Kontula, 2004). After a separate collaboration of four Nordic countries (Haavio-Mannila et al., 2003), a third attempt to collect cross-European data occurred in 2012. A group of European sex researchers developed a short questionnaire on key indicators of sexual health and applied twice for inclusion of this module into the European Social Survey module, which is conducted in 30 countries (ESS; https://www.europeansocialsurvey.org/). Unfortunately, this attempt was unsuccessful, because other modules were considered to be more important by the ESS team. Still looking for harmonization and comparability, a group of European sexual health survey researchers met during two expert meetings in 2015 and 2016. This resulted in a list of key indicators, consensus on 16 items to measure these indicators, and an overview of these key indicators in existing datasets. However, existing data proved difficult to compare across countries, and the implementation of the short survey across European countries was stymied by lack of funding. WHO persisted in encouraging collaboration and organized a hackathon consultative international meeting in 2020 to which several European national survey leads were invited. A hackathon brings together experts to work towards a clear goal in a short timeframe; in this case a 10-minute global sexual health survey instrument and guiding implementation strategies (Kpokiri et al., 2021). This instrument has been updated based on cognitive interview work in 2022 (the CoTSIS study; https://sites.google.com/view/cotsis-study/).

In 2019, a new international collaboration of researchers, practitioners, educators and social service professionals involved with sexual health and medicine formed the European Sexual Medicine Network (ESMN; https://www.esmn-cost.eu/). The ESMN was part of the EU funded European Cooperation in Science and Technology (COST). A subgroup within ESMN began to collaborate on adult national sex surveys. The subgroup leaders began by creating an inventory of researchers within the network who conducted population-based adult sex surveys themselves or who were able to connect to these researchers within their country. Researchers from eleven ESMN member countries responded to this call: Belgium, Czech Republic, Finland, France, Germany, Latvia, Netherlands, Norway, Spain, Sweden, and Britain. At the first meeting in Prague in 2021 the expertise and experience in conducting national sex surveys within this group was apparent, as well as a desire to continue to work towards harmonization.

The aim of this review was to synthesize lessons learned across these eleven European countries based on the experience of their survey leads and the researchers in their countries who preceded them. We review socio-historical and political changes over time and discuss how these have shaped survey research; we examine how the foci and topics of surveys have evolved, including commonalities and distinctions between countries, and we describe the methodological landscape, challenges and lessons learned from decades of sex survey research. By collaboratively pooling our experiential learning, we were able to highlight developing trends that could not be gleaned from published literature alone. In synthesizing this shared knowledge, we sought to support the research community in their perennial quest for political support and funding, and ongoing drive to advance methodology in future national sex surveys.

Surveys in This Review

This review concerns nationally representative surveys among adult populations (with a broad age range) in European countries that had a focus on sexual behavior and sexual health, broadly defined. Several countries also conduct surveys on specific subgroups (e.g., young people, older adults, couples or migrants) or specific sexual health topics (e.g., sexual violence or paraphilias). Although these studies provide valuable contributions to the knowledge of sexual health within specific populations, we excluded these from the selection to maintain our focus on the general adult population. We included only studies that aimed to be representative of the adult population. Most of these surveys used random selection (probability samples), although some used quota sampling. In general, measures were taken to correct for selective non-response, so

that the sample reflected the demographic characteristics of the population. Representativeness is a methodological challenge in all of these surveys, because it is generally not possible to assess non-responder bias with regard to the outcome measures of the study (e.g., sexual behavior or attitudes). Our review draws on eleven countries as case studies to illustrate broader principles and trends. This is not an exhaustive list of countries, but together these surveys represent the majority of those conducted in Europe and include wide variation in terms of cultural and political context, history and methodology.

Table 1 provides an overview of the 47 surveys that were included. The table illustrates the cross-country variation in numbers of sex surveys and methods. The number of surveys within the countries varies from one (Spain and Germany) to eight (Czech Republic and Norway). The lowest age limit was 14 (Belgium, 2013), the highest were 89 (Norway, 2020) and 90 (Czech Republic, 2020). Of the 47 surveys, 31 (66%) used a traditional probability based sample, by drawing a random sample from a population register or a register of addresses or telephone numbers. The other surveys used a panel (i.e., a panel of regular responders to online surveys, such as those maintained by large market research organisations), either a probability panel or a self-selected panel. The smallest sample size was 1,001 (Netherlands, 1991), the largest – in order to include enough gay people for statistical analyses – over 20,000 (France, 1992). Most surveys (21) used a paper and pencil questionnaire (PAPI) for data collection. Nine surveys used a Computer Assisted Web Interview (CAWI). France collected their data for all three surveys by a Computer Assisted Telephone Interview (CATI). Five surveys used either a Computer Assisted Personal Interview (CAPI; i.e., face-to-face interview with an interviewer, assisted by a laptop) or Computer Assisted Self Interview (CASI) or a combination of these two methods. Six surveys used another combination of data collection method.

The response rates of the included surveys ranged from 12% (Latvia, 2011) to 94% (Czech Republic, 2020), although differences in the ways that response rates are calculated mean that comparison is limited. For some surveys, response rates are unknown, for example, if a panel was used (Britain, Czech Republic) or if data collection was still ongoing (Britain, France, Latvia, Netherlands).

Historical and Political Background

The interest in and content of sex surveys have always been fueled by concerns in society and consequent concerns in politics. These concerns often stem from significant historical changes, for example, the arrival of the contraceptive pill, HIV or the internet. A certain degree of moral panic then sometimes arises, i.e., the fear that people's existing values and well-being are threatened. This is perhaps even more true for sexuality, as it often takes place in privacy, invisible to others. Reliable scientific figures on sexual behavior and values can then be reassuring (Ericksen & Steffen, 2001).

The late 1960s and early 1970s was the era of the so-called Western sexual revolution. This era brought widespread public discussion and debate about sexual issues and led to legal reforms in many countries (Kontula, 2009). Such discussions triggered an increasing interest among scientists, policy makers and professionals in population sexual behavior and attitudes, and in the use of modern contraceptives (i.e., the contraceptive pill). This knowledge was also required to support sexuality education that was beginning to develop in some European countries. The first European national adult sex surveys were conducted in this period in Sweden, Finland, and France. These countries were the pioneers in nationally representative sex surveys in Europe and in the rest of the world. In the 1970s the French national survey focused on contraception, and in Finland focused on sexual behavior and sexual dysfunctions.

The socio-political climate also influenced attitudes toward sexuality and sexual health in these decennia. Until 1989, the Berlin Wall divided not only Berlin, but all of Europe. Of the countries included in this review, the Czech Republic (part of Czechoslovakia until 1993) and Latvia (part of the Soviet Union until 1991) were Warsaw pact members up to its dissolution in 1990. The Warsaw pact influenced not only military matters, but also many other political and sensitive issues, including attitudes to sexual health. Before the early 1990s, official surveys on sexual health were not possible in many countries, including Latvia, because of the conservative attitudes of the communistic regime (Williams, 1994). One of the exceptions was the Czech Republic, where sexual health and pleasure and its impact on reproductive health of women was intensely surveyed between 1960–1980 (Lišková, 2018). Even after the Wall fell, the East-West division remained visible. One of the first overviews of sexual behavior and HIV/AIDS in Europe did not include former communist countries (except former East Germany), because their participation was not allowed at the time by the EU program under which this project was funded (Hubert et al., 2022).

The HIV/AIDS pandemic in the 1980s provided strong impetus to learn more about sexual behavior, but also caused surveys to focus more on sexual risk behavior than sexual behavior in general. There was growing agreement among professionals that accurate information on sexual practices in the general population was required to help predict and prevent the transmission of HIV. Sexual behavior therefore became a concern in epidemiological and health education surveys. However, the socio-political context in Europe was very diverse. In the then Soviet Union officials blamed foreign countries and denied the possibility of HIV spread among the Soviet people, so monitoring of sexual behavior was not permitted. The West German sexual science community refused to conduct a sex survey because of concerns that measuring sexual behavior could lead to repressive health policy measures (Matthiesen et al., 2021). In Western European countries, such as the UK, Norway and the Netherlands, the HIV/AIDS pandemic was the primary justification for the sex surveys conducted in the late 1980s and early 1990s. These surveys focused on behaviors that could transmit HIV and other STIs and it was often politically difficult to stray from any topic that did not have an obvious link to STI/HIV risk. A notable exception to this was the Finnish sex survey in the 1990s, which focused on the determinants of sexual wellbeing, not sexual risk behavior. This survey was one of the first to take a generational perspective and represented a new tradition of sexual health.

Table 1. Overview and characteristics of the surveys included in this review.

Country	Year	Name	Age	Recruitment	Sample size	Response/ cooperation rate[c]	Type of survey[b]	Topic	Key Citation
BE	1997	Sexual behavior study	18–49	Population register	4,632	11%	PAPI	STI/HIV risk behaviors	Peto et al. (1995)
BE	2013	Sexpert	14–80	Population register	1,825	38%	CAPI; CASI	Sexual health broad	Buysse et al. (2013)
GB	1990–91	Natsal-1	16–59	Household register	18,876	63%	PAPI	Sexual behavior, sexual attitudes, HIV risk	Wellings et al. (1994)
GB	1999–01	Natsal-2	16–44	Household register	11,161	64%	CAPI; CASI	Sexual behavior, sexual attitudes, STI/ HIV risk, reproductive health	Johnson et al. (2001)
GB	2010–12	Natsal-3	16–74	Household register	15,162	58%	CAPI; CASI	Sexual health broad	Mercer et al. (2013)
GB	2020–23	Natsal-COVID	18–59	Panel[a]	-	n/a	CAWI	Sexual health broad	Mitchell et al. (2023)
GB	2022–23	Natsal-4	16–59	Household register and Panel	-	-	CAPI; CASI; CATI; CAWI	Sexual health broad	-
CZ	1993	Sexual Behavior of Czechs I	15+	Panel	1,719	(83%)	PAPI	Sexual behavior and attitudes	Weiss & Zvěřina (1999)
CZ	1998	Sexual Behavior of Czechs II	15+	Panel	2,003	(81%)	PAPI	Sexual behavior and attitudes	Weiss & Zvěřina (2001)
CZ	2003	Sexual Behavior of Czechs III	15+	Panel	2,000	(80%)	PAPI	Sexual behavior and attitudes	Weiss (2006)
CZ	2008	Sexual Behavior of Czechs IV	15+	Panel	2,000	(62%)	PAPI	Sexual behavior and attitudes	Weiss & Zvěřina (2008)
CZ	2013	Sexual Behavior of Czechs V	15+	Panel	2,017	(62%)	PAPI	Sexual behavior and attitudes	Weiss (2014)
CZ	2020	Love and Intimacy	20–90	Panel	1,616	(43%)	CAWI	Sexual development, love and intimacy, sexual positions	-
CZ	2020	I-SHARE	18+	Panel	1,200	unknown	CAWI	Sexual behavior, reproductive health, sexual violence	Plášilová et al. (2021)
CZ	2022	Sexual Behavior, health and well-being in ČR	-	-	-	-	CASI	Sexual behavior, health and wellbeing	-
FI	1971	FINSEX	18–54	Population register	2,152	91%	PAPI	Sexual behavior and disorders	Sievers et al. (1974)
FI	1992	FINSEX	18–74	Population register	2,250	76%	PAPI	Sexual behavior and attitudes, sexual medicine	Kontula & Haavio-Mannila (1995)
FI	1999	FINSEX	18–81	Population register	1,496	46%	PAPI	Sexual Health broad	Haavio-Mannila et al. (2003)
FI	2007	FINSEX	18–74	Population register	2,590	43%	PAPI, CAWI	Sexual Health broad	Kontula (2009)
FI	2015	FINSEX	18–79	Population register	2,150	37%	PAPI, CAWI	Sexual Health broad	Kontula (2015)
FR	1970	Le comportement sexuels des Francais	20+	National quotas	2,620		PAPI	Marital life, contraception and sexuality	Simon (1972)
FR	1992	ACSF Analyse des comportements sexuels en France	18–69	Telephone register	20,055	76%	CATI	Sexuality + HIV	Spira et al. (1992)
FR	2006	CSF-2006 Contexte de la sexualité en France	18–69	Telephone register	12,386	75%	CATI	Sexuality, sexual health broad	Bajos & Bozon (2012)
FR	2022–2023	CSF-2022 Contexte des sexualité en France	15+	Telephone register	-	-	CATI+CAWI	Sexuality, sexual health broad	-
LV	1997	Reproductive Health in Latvia	15–45	Household register	4,568	83%	PAPI	Sexual behavior and wellbeing, reproductive health	Rudze et al. (1998)
LV	2003	Reproductive Health of the Population	15–49	Household register	2,452	-	PAPI	Sexual behavior and wellbeing, reproductive health	Putniņa et al. (2004)
LV	2011	Reproductive Health of the Population	15–50	Household register	2,617	12%	PAPI	Sexual behavior and wellbeing, reproductive health	Putniņa (2011)
LV	2022–2023	Sexual and Reproductive Behavior and Health of Population in Latvia	15–64	Household register	-	-	PAPI	Sexual behavior and wellbeing, reproductive health	-
NL	1991	Sex in the Netherlands	18–50	Population register of 50 municipalities	1,001	58%	PAPI	Sexual behavior, sexual attitudes, STI/ HIV risk	Van Zessen & Sandfort (1991)
NL	2006	Sexual health in the Netherlands	19–70	Panel	4,147	(28%)	CAWI	Sexual Health broad	Vanwesenbeeck et al. (2010)
NL	2009	Sexual health in the Netherlands	15–70	Panel	6,428	(20%)	CAWI	Sexual Health broad	De Haas et al. (2012)
NL	2011	Sexual health in the Netherlands	15–70	Panel	8,064	(19%)	CAWI	Sexual Health broad	De Graaf & De Haas (2018)
NL	2017	Sexual health in the Netherlands	18–80	Population register	17,248	26%	CAWI, PAPI	Sexual Health broad	De Graaf & Wijsen (2017)
NL	2022	Sexual health in the Netherlands	18–80	Population register	-	-	CAWI, PAPI	Sexual Health broad	-
NO	1987	Sexual behavior study 1987	18–60	Population register	4,220	63%	PAPI	Sexual risk behaviors	Sundet et al. (1989)
NO	1992	Sexual behavior study 1992	18–60	Population register	3,178	48%	PAPI	Sexual risk behaviors	Stigum et al. (1997)

(*Continued*)

Table 1. (Continued).

Country	Year	Name	Age	Recruitment	Sample size	Response/ cooperation rate[c]	Type of survey[b]	Topic	Key Citation
NO	1997	Sexual behavior study 1997	18–49	Population register	3,723	38%	PAPI	Sexual risk behaviors	Træen et al. (2003)
NO	2002	Sexual behavior study 2002	18–49	Population register	3,387	36%	PAPI	Sexual risk behaviors, pornography	Træen et al. (2006)
NO	2008	Sexual behavior study 2008	18–59	Population register	2,381	20%	CAWI, PAPI	Sexual behavior and wellbeing	Træen & Daneback (2013)
NO	2009	Sexual behavior study 2009	18–67	Panel	1,671	(39%)	CAWI	Sexual behavior and wellbeing, sexual identity	Træen & Stigum (2010)
NO	2013	Sexual behavior study 2013	18–29	Panel	2,090	(27%)	CAWI	Sexual diversity, sexual risk behavior, casual relationships	Træen et al. (2016)
NO	2020	Sexual behavior study 2020	18–89	Panel	4,160	(35%)	CAWI	Sexual diversity, sexual risk behavior, sexual wellbeing	Træen et al. (2021)
SP	2008	National Sexual Health survey 2008	16+	Population register	9,850	unknown	PAPI	Sexual behavior, satisfaction, sexual education	Ruiz-Muñoz et al. (2013)
SW	1967	Sexlive in Sweden	18–60	Population register	2,266	90%	PAPI	Sexual behavior and attitudes	Zetterberg (1969)
SW	1996	Lifestyle, sexuality and health	18–74	Population register	5,200	59%	PAPI	Sexual behavior and attitudes	Lewin et al. (1998)
SW	2017	SRHR2017	16–84	Population register	15,186	31%	PAPI	Sexual and reproductive health	Björkholm (2019)
GE	2018–19	GeSiD	18–75	Population register	4,995	30%	CAPI/CASI	Sexual health broad	Matthiesen et al. (2021)

[a]Panel = panel of regular responders to online surveys, either a probability panel or a self-selected panel, such as those maintained by large market research organisations.
[b]PAPI = Paper and Pencil Interviewing; CAPI = Computer-Assisted Personal Interviewing; CATI = Computer-Assisted Telephone Interviewing; CASI = Computer-Assisted Self Interviewing; CAWI = Computer-Assisted Web Interviewing (CAWI).
[c]Response rates are presented as reported by each study, therefore there may be inconsistencies in how these are calculated. For Panel studies, these are likely to be "cooperation rates" i.e. the proportion of invited panel members who completed the survey.

The textbook "New Views on Sexual Health: The Case of Finland" gave an important inspiration to continue the FINSEX surveys in the 2000s (Lottes & Kontula, 2000).

The HIV/AIDS pandemic did not only stimulate researchers but also donors to fund national surveys on sexual (risk) behavior. In Britain, there was significant debate about who should fund a national sex survey, despite broad support for conducting it amongst medical and social scientists, public health professionals and politicians. Groundwork for a survey in Britain was laid by two early epidemiological and feasibility studies (Overy et al., 2011). By 1988 a group of epidemiologists, social scientists, survey methodologists and public health professionals had constructed a proposal for a major survey (Spencer et al., 1988), and public research grant funding had been promised. However, the funding was withdrawn and the survey was vetoed at a governmental level. The prime minister at the time, Margaret Thatcher, believed it was an unacceptable intrusion of private life and declined to fund it. News of the government veto ("Thatcher halts survey on sex") led to controversy and public debate (Durham & Hughes, 1989). Several weeks later, the medical research charity (Wellcome Trust) stepped in to fund Natsal-1 and all subsequent Natsal surveys (Overy et al., 2011).

Other European countries also succeeded in getting governmental financial support to conduct sexual health research. In France, all surveys were initiated by the public authorities and financed by public funds. The National Agency for AIDS Research requested INSERM (Institut national de la santé et de la recherche médicale) to conduct a survey in 1989 and has continued its support for subsequent French sex surveys (2006 and 2022), including when they broadened their focus to sexual health. Sex surveys in the Netherlands did not face political opposition and the Dutch government of Health, Wellbeing and Sports has funded all Dutch sex surveys. In Sweden, the former Public Health Institute undertook, on assignment from the government, a national sex survey in 1996. The Sexual Behavior of Czechs Study in 1993 was funded directly by the Ministry of Health from the AIDS Fund. In Norway, the studies were financed by the Norwegian Directorate of Health. The Finnish sex survey in the 1990s was funded by the Academy of Finland, jointly by Social and Medical Committees, which represented the generational perspective and a new tradition of sexual health and later FINSEX surveys were funded by the Ministry of Social Affairs and Health. In many countries, however, funding is not guaranteed and has been harder to secure with each successive survey. This is partly because of increased costs of fieldwork – due to decreasing response rates – and other public health issues that require research, such as obesity and smoking. This is the case, for example, for Britain, Finland and Norway. In some countries (e.g., Belgium), there is no current prospect of a future survey. This funding precarity has adverse effects on, among other things, the ability to track long term trends or be prepared for future public health crises. Securing governmental financial support for systematic monitoring of sexual health therefore remains an important future challenge.

In some European countries, for instance, Latvia, the International Conference on Population and Development in 1994 in Cairo generated the necessary support for national sex surveys. In these countries, most surveys were therefore financially supported by United Nations (UN) organizations as well as The International Planned Parenthood Federation (IPPF). Previous Eastern Europe countries were selected among the countries that needed international research funding. One important aim of these surveys was to promote female sexual and reproductive rights internationally. In Latvia, surveys were conducted on improving the low birth rate and demographic consequences. In other European countries, including Norway, Sweden, and the Netherlands, sexual issues were increasingly studied from the perspective of sexual rights. The Swedish survey in 2017, for example, focused on sexual and reproductive health and rights from the perspectives of public health, equity and gender equality (Folkhälsomyndigheten, 2019). In the Netherlands, Britain and Spain, sexual behavior and sexual health became increasingly viewed as an aspect of lifestyle. In Spain in the 2000s, the new National Strategy for Sexual and Reproductive Health aimed at improving the sexual health status of the general population. The WHO agreement on the definitions of sexual health and sexual rights had an impact on this focus (WHO, 2006).

However, far right-wing and conservative politics are still threatening progress in sexual health and rights in some parts of Europe and globally. Conservative attitudes towards sexual health and rights within the European region were confirmed in 2016 when Hungary, Poland and Turkey disassociated themselves from the "Action Plan for Sexual and Reproductive Health: Towards achieving the 2030 Agenda for Sustainable Development in Europe – leaving no one behind" (WHO, 2016) and its resolution (adopted by the 66th session of the WHO Regional Committee for Europe). Despite a long preparatory period it was difficult to find consensus on sexual health, sexual and reproductive rights, and comprehensive sexuality education.

The most recent socio-historical influences on sex surveys have come from movements. The #MeToo movement (beginning in 2017) has increased focus on sexual violence and harassment and the sexual rights of oppressed and marginalized groups. Although the rights for lesbian, gay, bisexual, transgender and intersex (LGBTI+) people had already improved under the influence of gay and lesbian movements and organizations such as the Council of Europe and the European Union, the #MeToo movement also gave a boost to societal recognition and acceptance of LGBTI+ identities (Hildebrandt, 2014). Sex survey research has both shaped and reflected the focus on inclusiveness and sexual rights of oppressed and stigmatized groups, including sexual minoritized groups. The Council of the European Union now requires EU Countries to monitor the extent to which human rights for LGBTI+ people are respected (Council of the European Union, 2010).

The Evolution of Research Topics in Sex Surveys

In keeping with the evolving socio-political context just described, the topics of enquiry in European surveys have evolved significantly over time. In addition to broader

socio-historical change, this evolution reflects shifts in public health priorities, evolving conceptualizations of sexual health, and social change, including that driven by technology. For instance, more recent research (including from national surveys) has shown that pleasure is important to ask about in relation to risk, as well as being important in its own right (Klein et al., 2022). Since the 1990s, in many national surveys, there has been an increasingly broad inventory of topics and movement toward more holistic conceptualizations of sexual health, including pleasure and satisfaction. Several countries – including Germany and France – have been slower to adopt a more positive framing. Some topics are common to almost all European surveys undertaken in the last decade. These are: sexual orientation, age at first intercourse, frequency of sex, numbers and type of sexual partners, contraceptive use and condom use, sexual satisfaction, sexual difficulties/dysfunctions, and help seeking behavior. Within these broad topics, however, there is much variation in emphasis, and in particular questions asked. For instance, although number of partners (in a given period) is a common question, only Sweden has asked whether people are satisfied with their number of partners and only Britain, France and Finland have asked how people counted their lifetime partners. Only the British survey included a section that asked for detailed characteristics of up to three most recent partners, which allowed sexual network analysis.

Other topics have been introduced into sex surveys more recently to measure emerging behavioral trends driven by new technology. This includes questions on sharing of digital sexual messages/images and online dating e.g., in the latest Dutch (Sexual Health in the Netherlands), German (GeSiD) surveys, and the Natsal-4 survey in Britain. The GeSiD survey was among the first to include a question on sex with robots. A challenge is that these topic areas are "unstable"; changes in technology can quickly render the question obsolete and/or the terminology outdated. Technological and social change can also pose difficulties for tracking change over time. Many surveys seek to repeat questions in order to track trends over time (e.g., Britain, Finland, France, Netherlands, Czech Republic, Latvia), but wording can become outdated. For instance, with shifting trends away from marriage towards civil partnerships in many countries, questions referencing marriage – like the assessment of extramarital affairs in the Czech Republic until 2013 – have become outdated in recent years.

Some topics have evolved in response to changing recognition of issues/social mores. Notable examples are sexual harassment and consent. Although these topics have been included in the French surveys since 1992, most surveys have introduced or expanded these questions recently. Question emphasis and wording varies substantially in line with national discourses, legal definitions, and the status of scientific research on the topic. In the Netherlands, for example, the 2006 survey contained only a 1-item measure ("Have you ever been forced to do sexual things you didn't want to?"). This measure has been retained but supplemented with a multi-item scale in 2011, which provided good opportunities to further analyze differences in results from the two measures (De Graaf & De Haas, 2018).

In addition, the increased awareness of LGBTI+ rights calls for a revision of questions on sex (including intersex), gender, and sexual orientation. There is increasingly wide variation in how these questions are asked and in the level of nuance. Diversity of gender identities and sexualities has been a primary focus of many recent surveys (e.g., France 2022), while intersex has been included in the Dutch survey in 2022. Surveys vary in the extent to which they consider sexuality in later life. Some countries (e.g., Finland, Netherlands) have maintained a consistently high upper age limit, and others have no upper age limit (Spain, Czech republic). In contrast, other countries focus on participants <50, reflecting a focus on risk behavior. Some countries (e.g., Britain, Belgium, Norway) have had varying age ranges, dependent on funding availability and survey focus. Surveys including older people have been able to look at associations between health and sexual behavior, including the impact of medication on sexuality, and how health problems of a partner affect the sexual relationship (Field et al., 2013; Træen et al., 2021).

Sexuality has always been a sensitive topic, but some topics appear more sensitive than others. Despite increasing acceptance of masturbation in some countries as normal and healthy, it remains sensitive and is an item with a high proportion of missing data (missing data was 6% for masturbation in Finland and 3% in Britain, in contrast to 1% in the Czech Republic). Questions on sexual aggression have also yielded a high non-response rate (e.g., 8% in the Czech survey of 2013). In addition, some questions seem important but have been rarely asked because they are viewed as too sensitive for a population survey (e.g., pedophilia and other paraphilias). Exceptions are the Dutch and German surveys which asked about Bondage, Discipline, Sadism, and Masochism (BDSM) and the Dutch survey which included questions on transvestitism, fetishism and pedophilia, a Czech survey which focused specifically on all paraphilic patterns listed in ICD 10 (Bártová et al., 2021), and a Finnish survey which asked respondents which sexual behaviors they considered to be perverted or sick (e.g., sex with animals).

In terms of likely future trends, the link between sexual health and mental health is viewed as increasingly important by policy makers in most European countries (Gianotten, 2021). Measures of mental health were included in the majority of recent sex surveys (Britain, Czech Republic, Germany, Netherlands). This is leading to an increasing focus on sexual wellbeing (Mitchell et al., 2021) as well as behaviors with significant mental health sequalae such as sexual coercion.

Methodological Challenges and Solutions

Since the first representative population sex surveys in the early 1970s, European sex surveys have had to address both the common methodological challenges applicable to all survey research and also those specifically arising from the topic. Here we describe both types of challenges and discuss variation by country and over time.

Representing the General Population: Sampling Error and Non-Response Bias

The majority of surveys described here used probability sampling methods, i.e. where every member of the population of interest has a known, non-zero probability of selection, which is widely accepted to be the gold standard for generating a representative sample. Non-probability sample surveys have been consistently found to produce more biased estimates (e.g., Cornesse et al., 2020; Erens et al., 2014a). However, probability sample surveys tend to be substantially more expensive, and can require other resources that are not always available (e.g., a sample frame, a workforce of trained interviewers). Therefore, due to funding and practical constraints this has not always been possible (e.g., Czech Republic surveys; Netherlands surveys 1991–2011; British Natsal-COVID survey). These countries (also) used (web-based) panel samples, either a probability panel or a self-selected panel.

The countries that used probability sampling methods have varied in their sample design, driven by differences in the best available sample frame. For example, countries with a comprehensive population register of individuals (Belgium, Finland, the Netherlands, Norway, Spain, Germany) can select those who meet the eligibility criteria and invite them directly to participate. This approach minimizes sampling bias and makes fieldwork more efficient, because there is no need to visit ineligible or unoccupied addresses. This method can also lead to higher response rates, since it allows unconditional pre-posted monetary incentives, which have been shown to boost response (Matthiesen et al., 2021). Other countries overcome the lack of a population register of individuals by using a register of addresses (e.g., Britain) or random digit dialing (e.g., France). These methods have known coverage limitations (e.g., often exclude those living in institutions, although they were included in the French surveys in 1992) and are also far more labor intensive than the population register approach as they involve a large amount of screening for eligible individuals. Telephone selection (random digit dialing) – used in the French survey – has advantages, in that it is easier to contact people multiple times if they are absent.

In the past, there have been no viable online sampling frames of the general population. Countries unable to use a probability sampling method have usually been dependent on the large non-probability opt-in panels used by market research companies. These were originally sampled using non-probability methods (e.g., adverts), and typically used quotas to obtain a quasi-representative sample. These panels are well documented to be prone to sample coverage and response biases (e.g., Cornesse et al., 2020; Erens et al., 2014a) which makes their results less generalizable. However, in recent years there has been innovation in online "probability" panels, which aim to recruit representative samples using traditional probability sample methods (e.g., address-based sampling), then invite individuals to take part in web surveys (Czech Republic, Norway) (Bártová et al., 2021; Træen et al., 2021). These panels are a promising method of tapping into the benefits of web surveys as a mode of data collection (cheap, fast, and convenient for participants) with a lower risk of bias than volunteer panels (Scherpenzeel, 2018). Sample coverage issues remain, however, as these panels often only include those with access to the internet. This problem will likely reduce over time as the population becomes more digitally connected, but at the present time, a "digital divide" in internet access and digital literacy still exists, particularly with inequalities seen by region, age, education and socio-economic status (Van Kessel et al., 2022). Although increasing smartphone ownership opens new opportunities for recruitment and data collection, we would not recommend the use of smartphones to recruit people via social media adverts (i.e., "river sampling"). These methods are generally considered inferior in terms of representativeness, and therefore not useful for high quality general population research (Cornesse et al., 2020).

As well as choosing a sampling frame, other sampling considerations include the upper age limit, which has practical and cost implications. The decision to include or exclude older adults is often partly determined by the emphasis of the survey. For example, surveys primarily looking at STI epidemiology may focus on younger people, who are disproportionately affected by STIs. There are budget and statistical constraints too: with budget for a finite number of interviews overall, extending the age range reduces the number of respondents in each age group, therefore reducing the analytical precision. In addition, for some sample frames, selection bias must be considered for the older age groups, as with each increasing year of age, a higher proportion of older adults live in institutions; therefore, those that would be captured by a residential address-based sample that excludes institutions (e.g., Britain) may not be representative of their cohort more generally. Because issues relating to sexuality remain relevant throughout the life course, specific studies of older adults are sometimes conducted to mitigate this selection bias (Træen et al., 2018).

Response Rates, Sample Size, and Cost

Regardless of the sample design, getting people to take part is increasingly challenging for all survey research. The internationally accepted metric for assessing participation is the "response rate": the percentage of those estimated to be eligible who actually complete the survey (American Association for Public Opinion Research, 2023). Although low response rates do not necessarily imply bias (Søgaard et al., 2004), and high response rates do not necessarily mean a survey is more representative (e.g., Sturgis et al., 2017), higher response rates provide logical reassurance and are generally considered an important indicator of survey quality. There is an assumption that sex surveys will elicit a lower response rate than other surveys as the topic may be off-putting to some, and this has been borne out in some countries (e.g., Belgium; Buysse et al., 2013). However, it is not clear that this is the case for all countries, with several sex surveys achieving comparable response rates to surveys on other topics (e.g., Britain). The first Finnish sex survey in 1971 achieved a response rate of 91%, which is astonishing even in that era, likely at least in part due to the highly trained midwife field workers who personally visited each selected address to recruit and interview participants (Sievers et al., 1974).

As with surveys in general (e.g., European Social Survey, 2022), response rates vary enormously between the sex surveys

(See Table 1). This is partly due to a lack of standardization in calculation of response rates, further complicated by the range of sampling approaches used by the different sex surveys, particularly the inclusion of probability panels. Studies using these studies often present "cooperation rates" (the proportion of invited panel members that took part) instead of "response rates." Furthermore, response rates can be affected by many different factors, not only design features, including the mode of recruitment (personal visits from fieldworkers generally elicit higher response rates than postal or email invitations), additional motivators (including monetary or other incentives, salience of the research topic), and barriers (including survey length, convenience of the survey mode), but also individual and socio-cultural factors (e.g., acceptability of the topic, trust in institutions and research, attitudes towards participation in civic activities, views on data privacy). It is therefore hard to draw any conclusions about which design creates the highest response rates, based on the content of Table 1.

However, one commonality presented in Table 1 is that in the 50 years since the first European sex survey was conducted, response rates have been declining over time, even in countries that originally obtained high response rates. This is the case for surveys on other topics as well (Luiten et al., 2020), and is a major concern for survey methodologists, funders, and data users as it raises questions about how well those who take part reflect the population as a whole. There is limited evidence on whether this decline in response rates reflects an increase in response bias, or whether particular population groups are becoming less well represented in surveys over time, although one analysis of birth cohort distributions in the German and USA General Social Surveys found that reduced response rates over time can primarily be attributed to change in general societal survey climate, rather than changes in which birth cohort groups are willing to take part (Gummer, 2019). There is good evidence that probability sample surveys still generate higher quality data than convenience sample methods despite these declines in response rates (Cornesse et al., 2020); however, considering the rising cost of fieldwork, it is increasingly difficult to justify, and obtain funding for, probability sample surveys. This is especially challenging for sex surveys, where the topic may not be perceived of as a core concern of funders, and where large sample sizes are often needed (thousands or tens of thousands), due to the fact that some of the sexual behaviors, outcomes, and populations of interest are rare in the general population.

Choices about the best available design to represent the population are country and context (e.g., era) specific, and will depend on budget, available sample frames, and existence (or not) of an interviewer workforce. We recommend consulting a methods review to inform design decisions, such as the scoping reviews recently carried out in Britain (Clifton et al., 2019) and Ireland (Tierney & Kelleher, 2021).

Questionnaire Design and Language

A wide range of topics could be considered legitimate for a general population sex survey to measure. As different topics within the broad topic of sexuality may be related to each other, a large number of topics have to be included within a single long interview. However, this needs to be balanced against keeping the interview to an acceptable length. In addition, especially for the earlier surveys, researchers needed to be mindful that some topics were poorly understood by, or even offensive to, some participants (Spencer et al., 1988). Finally, although psychometrically validated measures do exist, they tend to be long, or require high reading ability, making them unsuitable for a general population sex survey. A notable exception is the Natsal-SF measure of sexual function, which was specifically developed to overcome some of these issues (Mitchell et al., 2012). However, non-validated measures, including single item measures, are commonplace, and these vary in terms of the amount of information available to assess their performance. There are currently limited cross-national standardized measures of sexual behavior to facilitate international comparisons.

Designing survey questions on sex presents a number of challenges. Qualitative work undertaken in the development of the French and the British surveys found that the participants preferred language that was neither medical nor slang (Spencer et al., 1988; Spira et al., 1992). However, the use of euphemism in everyday life to talk about sex has resulted in a lack of commonly accepted and understood language for sexuality. Language and concepts in this field also change over time, and questions can quickly seem outdated, which is problematic for repeated surveys that aim to compare sexual behavior and attitudes over time. Shifts in attitudes also mean that question wording can move from acceptable to unacceptable. For instance, in the Natsal survey, response options of "always wrong, sometimes wrong, never wrong" to the question of "what is your view on sexual relations between two men" used in the first three surveys, was more recently deemed unethical because of its implied assumption of same-gender relationships as "wrong." The wording was updated (to "always acceptable") for the fourth survey, but in addressing these issues, the cost was a loss of ability to track societal attitudes towards same gender relationships over time.

Some questions that were previously straightforward have now become complex. In earlier surveys, gender was measured as a binary (either male or female) (Muschalik et al., 2021). In the UK Natsal surveys waves 1, 2 and 3 this was simply recorded by the interviewer on visual assessment of appearance. In the latest surveys in Britain and the Netherlands, measurement of gender and sex has become highly complex, with intricate filtering to capture relevant aspects of gender and sex for participants as well as their partners. In the Netherlands, a two-step gender measure has been used since 2016, asking for birth-assigned sex as well as for current gender identity (Lagos & Compton, 2021). The forthcoming (fieldwork 2022–23) British Natsal-4 survey is taking a similar approach, with an additional "trans status" question (Clifton et al., 2021). The relative unfamiliarity of intersex among the general public, as well as complexity in how individuals diagnosed with intersex/disorders of sex development identify, makes this concept especially hard to measure.

Other topics are particularly difficult to measure. Asking about experiences of sexual violence has proved challenging because of safeguarding issues, particularly for surveys in which an interviewer is not present to check for participant

safety/distress, but also because it is a complex topic, where questions are sensitive to interpretation differences (Bajos & Bozon, 2012; De Graaf & De Haas, 2018). However, it is also an important topic, given its influence on sexual and general health, as the German GeSiD survey showed (Brunner et al., 2021).

Other topics are challenging to research because they are relevant to only small sub-groups of the population and there are insufficient numbers for statistical analysis. For instance, data from a Natsal-3 question on swinging and Dutch data on forced prostitution were never published because numbers were too small to undertake meaningful analysis. Similarly, topics like chemsex (i.e., sex under the influence of drugs) are difficult to ask because of small numbers at a population level, even though this is a key phenomenon within gay communities. Even where numbers are sufficient for analysis, accurately measuring rare experiences or sub-populations is challenging, especially where the topic is sensitive and may be prone to misreporting, as small amounts of misreporting can have a real impact on data quality and can substantially overestimate or underestimate these phenomena.

Will People Tell the Truth?

Sex surveys aim to measure some of the most private aspects of peoples' lives, and sex survey researchers are often asked "will people really tell the truth?" (Spira et al., 1998). There are two main biases that could be expected to be greater for sex surveys than for other topics: refusal to answer questions (item non-response); and inaccurate reporting, for example, due to social desirability bias given the taboo and stigmatized nature of some of the topics covered. These biases are known to be affected by the design of the survey (Hope et al., 2014). For example, more private interview modes (i.e., web survey, self-completion questionnaires) elicit higher reporting of sexual behaviors that might be considered less socially acceptable, compared with interviewer-administered modes (Burkill et al., 2016; Tourangeau & Smith, 1996). Hence, most of the major European sex surveys are either designed to be entirely self-administered or include a self-completion element for the more sensitive questions. Item non-response is easy to measure, and in fact is often found to be low for interviewer-administered surveys (e.g., <3% in Natsal-3, Erens et al., 2014b), suggesting that people are willing to answer questions about sexual behavior.

However, assessing reporting bias is much more challenging. There are few measures for which it is possible to check bias within surveys or to compare with external benchmarks (e.g., routine data). One possibility to check for bias within surveys is to investigate gender discrepancy in reporting lifetime partners, because of the mathematical fact that in a closed population the number of lifetime opposite-sex partners reported by men should equal to the number reported by women. In practice, the mean reported lifetime partner numbers for men is often found to be higher than for women (Mercer et al., 2013), although this discrepancy has reduced over time and is much lower for shorter reporting timeframes. Recent analysis of the British Natsal-3 data suggested that two-thirds of the gender gap in reported lifetime partners could be explained by: (1) greater propensity among men to report extreme numbers of partners; (2) greater tendency of women to count rather than estimate; and (3) gendered differences in attitudes toward casual and nonexclusive sex leading to reporting bias (Mitchell et al., 2019). In Finland this gender gap disappeared in the sex surveys in the 2000s because of an increase in the average number of lifetime partners among women, which suggests an underreporting of lifetime partners among women in earlier surveys (Kontula, 2015).

An exception where an external benchmark was available were abortion rates, for which excellent routine data exist in some countries (e.g., France, Britain, The Netherlands), where some surveys have been shown to underestimate abortions (Scott et al., 2019). However, it is difficult to extrapolate from this to other sex survey measures. Reporting bias is likely to be affected by the cultural context and era; thus, we might expect this to vary by country and over time. Indeed, analysis of reporting bias in the British surveys found a decrease in reporting bias between the 1990–91 and 1999–2001 surveys, but little change between 1999–2001 and 2010–12 (Prah et al., 2014). Cultural differences in reporting might, for example, explain why a European survey on violence against women (which used the same measure in each country), found higher prevalence rates of sexual violence in the more gender-equal countries (Humbert et al., 2021). Qualitative work with survey respondents in Britain found that assurances of confidentiality, survey legitimacy, rapport between interviewer and respondent, and perception of the benefits of the research helped elicit accurate reporting of sexual behavior (Mitchell et al., 2007).

Conclusions and Recommendations

Since the so-called sexual revolution in the West in the 1970s there has been an increasing scientific and public health interest to know and understand more about human sexual behavior and its impact on society. Representative national sex surveys have provided a unique and vital source of the necessary accurate information on sexuality and sexual health. European countries have been pioneers in these studies. The HIV epidemic, which began in the 1980s, activated research in this field and led to cooperation between researchers in Europe, including some comparison across countries. The foci of national surveys have evolved to keep pace with an increasingly complex socio-sexual landscape.

This review synthesized learning across 47 previous national sexual health surveys in Europe in eleven countries. These surveys demonstrate that it is possible to collect high-quality population data on a range of aspects of sexual health, despite the sensitivity of the topic. In these eleven European countries there has been increasing recognition of the need for data on sexual behavior. Survey teams have faced different challenges in recent years. Fieldwork costs are higher than ever before, the response rates of representative surveys are decreasing, and the formulation of questions and questionnaire construction is terminologically and technically more demanding than ever. The lessons learned from scoping reviews conducted for previous European sex surveys may be useful to inform these methodological choices in countries

where such surveys are nascent or not yet being conducted (Clifton et al., 2019; Tierney & Kelleher, 2021).

The future for national surveys will not be straightforward. Obtaining funding is an ongoing challenge and will be increasingly difficult where sexual health competes with other public health priorities and where fieldwork costs escalate due to falling response rates. Probability web panels offer opportunities. Although there is encouraging evidence about their representativeness, response biases between these and other probability methods are not yet fully understood. Further work is needed to understand the extent to which probability panels may become a viable alternative for collecting detailed representative data on sexuality.

Although there is increasing policy recognition of a framing of sexual health that goes beyond risk, it remains more difficult to justify and stimulate funders to support studies that aim to promote sexual well-being than to support studies that aim to prevent sexual risks (e.g., STIs and unintended pregnancies). In some Eastern European countries (e.g., Latvia), the political climate continues to obstruct funding for national sexual surveys. They have not been considered important or their results have been viewed critically. To obtain funding, it is crucial to emphasize why sexual behavior and sexual health are important and that research contributes to improving sexual health and wellbeing. This includes making visible that the results are used by policymakers, educators and services (UCL, 2022). This is important in all European countries, but especially in countries where the relevance of national sex surveys is less straightforward.

Whether there will be greater harmonization across national surveys in the future remains an open question. To an extent future collaboration is limited because of the need for countries to use their existing questions in order to track trends over time. However, interpreting the results in a country would be greatly improved if these results could be compared across countries. Pan-European estimates would also strengthen the evidence to support investment in sexual health. But if standardization is not possible, improved collaboration between researchers – in efforts such as this – supports better question and survey design and helps researchers to respond better to changes. Such collaboration requires funding, such as the EU COST Action which supported this initiative.

Although several European countries have been frontrunners in innovative and comprehensive national sex surveys, they will struggle to continue this contribution without funding from large funding schemes such as Horizon Europe. If Europe wants to continue to lead the way in providing the evidence to ensure the sexual health and wellbeing of its citizens, the European Union needs to invest in this important topic.

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ORCID

Hanneke de Graaf http://orcid.org/0000-0002-2350-0230
Bente Træen http://orcid.org/0000-0002-7335-9917

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