

UNIVERSITY OF TROMSØ

# Early sexual debut and health outcome in Norwegian men who have sex with men (MSM)

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An anonymous internet based cross-sectional survey through a chat-room targeted at men who have sex with men (MSM)

Med-3940, 5th year assignment  
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## **2.0 Definitions**

MSM – men who have sex with men

NIPH – Norwegian institute of public health

MSIS – the Norwegian Surveillance System for Communicable Diseases

UAI – unprotected anal intercourse

AFAI – age at first anal intercourse

STI – sexual transmitted infections

Anonymous partner – a sex-partner with an unknown identity (unknown name, face, meet in a “dark room” etc.)

Casual partner – a sex-partner that the person doesn’t have a steady relationship with.

XTC – ecstasy

Poppers – Butyl or amyl nitrate. Liquid used for inhalation. Increases heart rate, dilate arteries and causes drop in blood pressure. This produces a "rush" that can be enjoyable; some experiences increased sexual desire. [www.homohealth.org](http://www.homohealth.org)

## 1.0 Abstract

**Introduction:** HIV incidence in MSM in Norway has increased since 2003. Several studies find associations between sexual debut age, HIV, usage of drugs and alcohol as well as increased amounts of emotional and physiological distress. The overall aim of this study was to describe the sexual debut age among a convenience sample of Norwegian MSM taking part in an internet survey, and examine possible associations between an early sexual debut (first intercourse with another man before 14 years of age) and work; education and income; self-perceived-health; sexual identity and sexual risk behaviour; drugs and alcohol use; and self-reported HIV status.

**Methods:** A cross-sectional internet-based survey was done in 2007 among members of a MSM-oriented Norwegian web-site. A self-administrated standardized questionnaire was filled in anonymously and submitted in a questback format. Descriptive statistics are presented and the strength of associations was measured by Pearsons's chi-square test and univariate logistic regression analysis.

**Results:** The survey had 2598 respondents (16-74 years range), 383 with an early debut (84 with no debut) and 2106 with a later debut. An early sexual debut was associated with: a low education (OR=1,8 [1,2-2,8]); being unemployed/ retired/ social security taker (OR=1,7 [CI 1,2-2,4]); having >10 lifetime sex-partners OR=2,0 [1,5-2,6]; >500 lifetime sex-partners OR = 2,1 [1,3-3,3]; unprotected anal intercourse with a casual partner OR=1,5 [CI 1,1-2,0]; poor self-perceived health OR=2,6 [1,3-5,2]; taken a HIV test OR= 1,5 [1,2-2,0]; feeling drunk alcohol intoxicated >7 times a month (OR=1,5 [1,1-1,9]; ever tried: marihuana/hash, pharmaceuticals, ecstasy (XTC), LSD, GHB, cocaine, heroin, amphetamine, methamphetamine, "poppers" and Viagra (lowest for poppers OR = 1,4 [1,1-1,8], highest for methamphetamine OR = 4,4 [2,2-8,8]).

**Conclusion:** We found an association with numerous sexual partners and unprotected anal intercourse (casual partner), but no associations to HIV status. An early debut was associated with having taken a HIV test and a higher usage of drugs and alcohol among the early debut group. Our results show associations between an early sexual debut and a poorer health outcome, compared to a late debut.

### **3.0 Introduction**

There are few epidemiological studies on the sexual debut in men who have sex with men (MSM) and health outcome, though there are many studies on MSM and risk taking behaviour in general. To our knowledge, there are no Norwegian studies on this theme. According to the Norwegian institute of public health's (NIPH) repeated surveys on sexual behaviour the median age for sexual debut in Norway has decreased for both genders over the last decades (1, 2). The sexual debut seems to be lower in the MSM population than in the general population, with a mean age of 15,7 years and median age 15 in 2002; compared to a median of 17,5 years for men in the general population (2). Since the NIPH's survey was done in 2002 we have few up to date available studies on sexual debut and behaviour in Norway. The measurement of prevalence and incidence of health conditions or infections in subpopulations such as men who have sex with men (MSM) is hampered by the unknown size and regional distribution of this "hidden" population (3). This is also the case for NIPH's sexual behaviour survey, which had a low number of attendances from the MSM population.

A Swedish study show that teenagers with a sexual debut at 14 year or younger tend to have less positive school experiences, and more involvement in injuries and physical violence. The girls were less physical active, and the boys more physical active; both genders perceived their health as poorer than teenagers without intercourse experience (4). Gay juveniles are shown to have a higher rate of emotional/psychological problems such as anxiety, depression, and a higher risk of suicidal attempts. Those who have their sexual debut early, or recognize their sexuality as homophile at a young age seems to be particular at risk (5, 6).

An American study report an association between drug use and unprotected anal intercourse (UAI) (7). One study report an association between an early sexual debut and drug use, especially with the use of marihuana (5), another report more drug related problems (8). An early sexual debut is as well associated with smoking in MSM (9).

An Australian study finds a strong link between the age at first anal intercourse and infection with HIV and sexual transmitted infections (STI's), as well as tendencies to engage in high risk sexual behaviour (10). An early debut seems to be associated with sexual risk behaviour, such as numerous of sexual partners (11, 12), and unprotected anal intercourse at sexual debut (13). Younger age at fist intercourse is associated with higher risk of STI's compared to those

who are older at the time of debut. The effect seems to be strongest in young adults and juveniles, and diminishes with a higher current age (14). HIV-positive men were found to be significantly younger on average when they first had anal intercourse compared with HIV-negative men (10). According to the Norwegian Surveillance System for Communicable Diseases (MSIS) 76 new cases of HIV for the MSM group was reported in 2012, counting for 31,4 % of the total cases (table1). Even though there was a decrease of cases from 2011 to 2012 there has been an increase in HIV cases for the MSM group since the end of the 90's, especially from 2003 (15, 16). Internationally the importance of HIV preventive strategies for the MSM group is emphasized, and evidence points to an increase in the HIV prevalence for this group worldwide, as well in the western world (17).

**Table 1 HIV infections in Norway by year of diagnosis and way of infection:**

	<03	03	04	05	06	07	08	09	10	11	12	Total
Nosocomial infection					2		1					3
Blood/transplantation	25							1				26
Heterosexual	1120	153	161	134	165	141	184	171	157	155	142	2683
Unknown	47	10	2	3	7	8	5	8	4	2	6	102
Maternal	29	5	1	5	6	9	4	4	1	4	7	75
Other	3							1				4
Needles	473	13	15	20	7	13	12	11	11	10	11	596
Cut- injury/exposed to blood				1								1
Homosexual	836	57	71	56	90	77	93	88	85	97	76	1627
Blood factor	21											21
<b>Total:</b>	2554	238	250	219	277	248	299	284	258	268	242	5137

Table is generated from MSIS, [www.fhi.no](http://www.fhi.no).

Most studies relate the MSM population to the growing HIV epidemic the last 30 years. It might be just as important to enlighten other health problems existing in this population. Several studies show that there is an association between an early sexual debut and health/social problems compared to those with a later debut (4, 5, 8, 10-13). The overall aim of this study is to describe the sexual debut age among a convenience sample of Norwegian MSM taking part in an internet survey, and examine associations between an early sexual debut and work, education and income; self-perceived health; sexual risk behaviour; self-reported HIV status; and drugs and alcohol use.

Specific research questions are to:

- describe the sexual debut age among MSM. How is the median sexual debut age in this survey compared to the sexual debut age among heterosexual men and women in the general population?

And examine if an early sexual debut is associated with:

- sexual identity.
- education, work and income.
- sexual risk behaviour such as the lifetime number of sexual partners and unprotected anal intercourse with casual or anonymous partners.
- self-perceived health.
- self-reported HIV prevalence, and HIV testing.
- usage of alcohol and drugs.

## **4.0 Methods**

Data for this study are obtained from the internet survey “Chatting on the internet, e-dating and sexual risk behaviour among Norwegian men who have sex with men (MSM)” (18, 19).

### **About the survey**

In October 2007 the Norwegian institute of Public Health in cooperation with Gay and Lesbian Health Norway completed an anonymous internet based cross-sectional survey through a chat-room targeted at men who have sex with men (MSM). The survey was completed at [www.gaysir.no](http://www.gaysir.no), the single largest internet community for homosexuals in Norway. At that moment Gaysir had about 31.000 member profiles and more than 50.000 visits each week. The site provides new items, a chat-community, a discussion forum, an event calendar, links and other information. Participation was offered to logged-in members from 1<sup>st</sup> to 19<sup>th</sup> of October 2007. The participants were first guided to an introduction where the aims and structure of the study were explained. Participation was voluntary and anonymity was assured. Pilot testing was done with an offline and online testing of the questionnaire by 15 MSM who provided a detailed feedback on the content, functionality and the questionnaire layout. Data were collected using the online survey tool Questback, harvested in Excel format and transformed to an SPSS file.

The questionnaire had a total of 117 questions; it took about 45 minutes to finish. The questions can be parted in 7 sub-groups: 1) Demographics and personal information, 2) sexual behaviour, 3) Health and use of health services 4) dating and e-dating, 5) last e-date with sex, 6) drug and alcohol use 7) condom use and knowledge about STI's. In this study we have not used items from group 7.

### **Participants**

The survey had a total of 2598 participants, 19 women were excluded, and 6 were excluded because of age below 16 years; leaving a total of 2573 participants. 84 participants reported that they never have had sexual relations to another man, thus leaving 2489 participants in the main outcome variable, sexual debut age.

### **Sexual debut**

A heterosexually debut means first time of vaginal intercourse between a man and a woman. In a homosexual context a range of sexual events can be categorized as debut; the first sexual encounter with another man regardless of the sexual act performed; the first sexual encounter with another man who also identified himself as gay; the first act of penetrative intercourse regardless of the partners sex; the first act of anal intercourse with a man; there are many more examples (20, 21). In this study the question "how old were you the first time you had sexual intercourse with another man" was used to specify the sexual debut age. The lowest possible answer was 10 years, and the highest 50 years or more.

In this survey we study vulnerability in those with an early sexual debut compared to those of a later sexual debut. An early sexual debut is in this survey defined as sexual relations to another man before 14 years of age.

### **Data management and analysis**

Statistical analyses are done with SPSS, version 19.

The main variable is sexual debut age, which is divided into two groups: early debut (debut before 14 years) and later debut (14 years and later). Sexual debut age is described as median age and range of distribution. For sexual risk behaviour the variables used are lifetime numbers of sexual partners and unprotected anal intercourse with anonymous or casual partner.

For self-reported HIV prevalence the variable "what was the result of your last HIV test" was used. For alcohol consumption the question "how many times did you drink until you felt

buzzed/intoxicated last month” was used. For drug use the variable “how many times have you tried (drug) the last 12 months” was used.

Univariate frequency distributions in percent and means with standard deviations were used to describe categorical and continuous variables, respectively. For the logistic regression we used dichotomized variables, which are shown in tables. The strength of associations between an early versus a later sexual debut and other health and social variables were measured with Pearson’s chi-square test and univariate logistic regression analyses, where sexual debut age was treated as the independent variable. P-values and odds-ratios (OR) with 95 % confidence intervals are presented. A p-value  $\leq 0.05$  was considered significant. In the tables used in this survey the group “total” includes those with no sexual debut (N=84).

## **Ethics**

The study was approved by the Regional Committee for Medical and Health Research Ethics, Southern Norway, and by the Norwegian Data Inspectorate.

## **5.0 Results**

### **5.1 Characteristics of MSM respondents**

Characteristics of MSM respondents are described in table 2. Of the total 2598 participants, 2573 was included for the general description statistics. The participants were between 16 and 74 years old, with a median age of 30 years. Mean age was 32,4 +SD 11,2. Almost all participants lived in Norway, 75,8 % lived in a city or a greater city. 60 % lived in Eastern Norway, most of them in Oslo. 93% of the population reports their cultural background as Norwegian. About half of the population lives alone. 3,2 % are married, 6,5 % lives with a partner and 15,4 % lives with roommate of the same gender. 5,2% has not completed more than primary school, 56,8% has a higher education. About 70 % is employed, and a fifth of the respondents are students. About 13 % had a high income, meaning more than 500 000 NOK a year. About 29 % had a low income, meaning less than 149 900 NOK.

**Table 2 Characteristics of MSM respondents in the internet-based cross-sectional study, grouped by sexual debut:**

	Total* <sup>1</sup>		Early debut		Later debut	
	N	%	N	%	N	%
<b>Age:</b>						
16-25	849	33,0	124	32,4	668	31,7
26-35	797	31,0	113	29,5	668	31,7
36-45	578	22,5	83	21,7	486	23,1
46-55	255	9,9	50	13,1	203	9,6
55<	94	3,7	13	3,4	81	3,8
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>383</b>	<b>100,0</b>	<b>2106</b>	<b>100,0</b>
<b>Place of residence:</b>						
Norway:	2517	97,8	375	97,9	2059	97,8
Abroad:	56	2,2	8	2,1	47	2,2
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>383</b>	<b>100,0</b>	<b>2106</b>	<b>100,0</b>
<b>Regions:</b>						
Eastern Norway:	1659	64,5	230	60,1	1387	65,9
Southern Norway	64	2,5	9	2,3	50	2,4
Western Norway	439	17,1	68	17,8	355	16,9
Trøndelag	201	7,8	31	8,1	158	7,5
Northern Norway	161	6,3	33	8,6	120	5,7
Other:	49	1,9	12	3,1	36	1,7
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>383</b>	<b>100,0</b>	<b>2106</b>	<b>100,0</b>
<b>Place of residence:</b>						
0* <sup>2</sup>	(25)	(1,0)				
Rural	98	3,8	17	4,5	76	3,6
Smaller town (200-2000 inhabitants)	162	6,3	28	7,4	123	5,9
Town (2001-20000 inhabitants)	339	13,2	41	10,9	277	13,3
City (20.001-100.000 inhabitants)	493	19,2	89	23,7	387	18,5
Greater City (over 100.000 inhabitants)	1456	56,6	201	53,5	1225	58,7
<b>Total</b>	<b>2573</b>	<b>100,0</b>	<b>376</b>	<b>100,0</b>	<b>2088</b>	<b>100,0</b>
<b>Cultural background:</b>						
Norwegian	2357	91,5	357	94,2	1924	92,6
Western immigrant	89	3,5	9	2,4	79	3,8
Non-western immigrant	39	1,5	6	1,6	32	1,5
Other/missing:	88	3,5	7	1,8	43	2,1
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>379</b>	<b>100,0</b>	<b>2078</b>	<b>100,0</b>
<b>Sexual orientation:</b>						
0* <sup>2</sup>	(1)	(0,0)				
Heterosexual	12	0,5	0	0,0	7	0,3
Homosexual	1899	73,8	287	74,9	1569	74,5
Bisexual/uncertain	661	25,7	96	25,1	530	25,2
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>383</b>	<b>100,0</b>	<b>2106</b>	<b>100,0</b>

\*<sup>1</sup> Total including those without a sexual debut.

\*<sup>2</sup> Missing.

**Table 2 Characteristics of MSM respondents in the internet-based cross-sectional study, grouped by sexual debut (continued):**

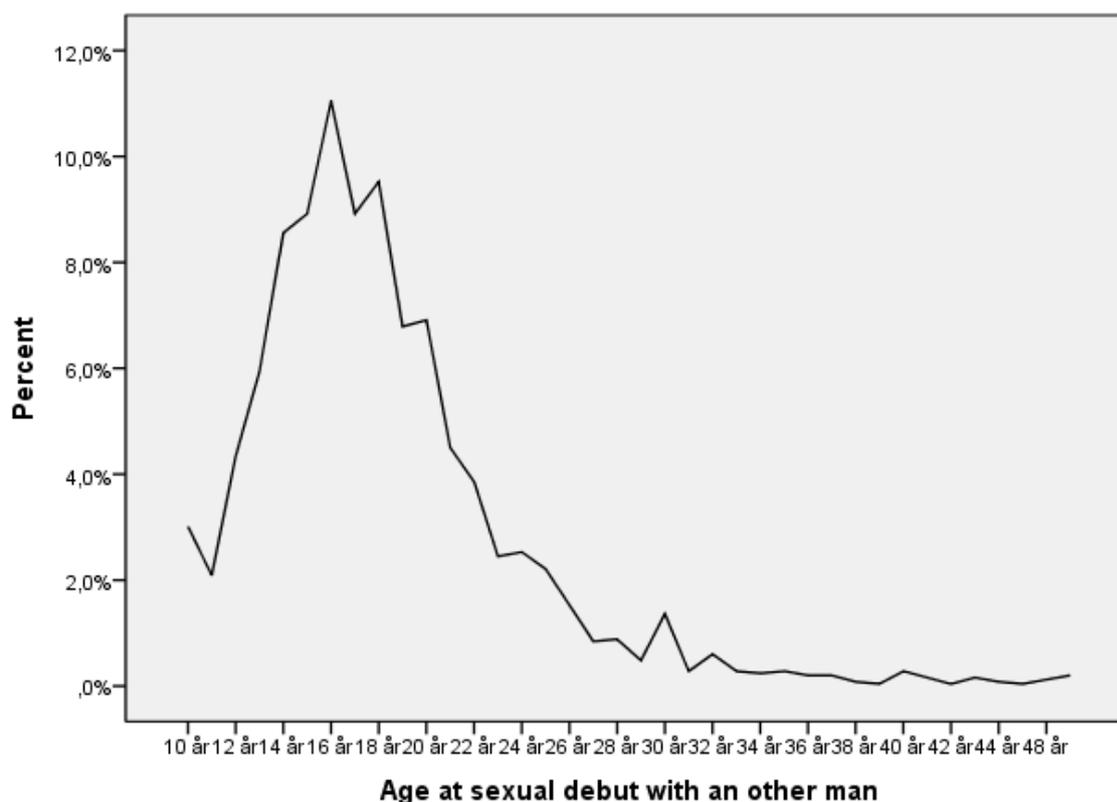
	Total* <sup>1</sup>		Early debut		Later debut	
	N	%	N	%	N	%
<b>Education</b>						
0* <sup>2</sup>	(3)	(0,1)				
Primary/secondary school (≤9 years)	133	5,2	29	7,6	91	4,3
High school, practical classes	494	19,2	100	26,1	382	18,2
High school, theoretical classes	450	17,5	69	18,0	352	16,7
Major education, 2-4 years,	951	37,0	125	32,6	812	38,6
University, higher graduates	510	19,8	53	13,8	442	21,0
Others	32	1,2	7	1,8	24	1,1
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>383</b>	<b>100,0</b>	<b>2103</b>	<b>100,0</b>
<b>Income:</b>						
0* <sup>2</sup>	(12)	(0,5)				
No income	159	6,2	22	5,8	120	5,7
0-49 900 NOK	230	8,9	33	8,6	174	8,3
50 000 – 149 900 NOK	356	13,8	52	13,6	291	13,9
150 000 – 199 900 NOK	130	5,1	25	6,5	104	5,0
200 000 – 249 000 NOK	205	8,0	31	8,1	170	8,1
250 000 – 299 000 NOK	262	10,2	50	13,1	205	9,8
300 000 – 500 000 NOK	882	34,3	123	32,2	747	35,6
>500 000 NOK	337	13,1	46	12,0	285	13,6
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>382</b>	<b>100,0</b>	<b>2096</b>	<b>100,0</b>
<b>Employment:</b>						
0* <sup>2</sup>	(12)	(0,5)				
Paid work	1789	69,5	266	69,6	1491	71,2
Unemployed/searching for work	78	3,0	13	3,4	63	3,0
Student/pupil	478	18,6	51	13,4	386	18,4
Military service/civil service	7	0,3	0	0,0	7	0,3
Social security/retired	95	3,7	22	5,8	68	3,2
Sick leave	45	1,7	12	3,1	31	1,5
Staying at home	8	0,3	2	0,5	4	0,2
Other:	61	2,4	16	4,2	45	2,1
<b>Total:</b>	<b>2573</b>	<b>100,0</b>	<b>382</b>	<b>100,0</b>	<b>2095</b>	<b>100,0</b>

\*<sup>1</sup> Total including those without a sexual debut.

\*<sup>2</sup> Missing

## 5.2 Sexual orientation and sexual debut

15,4 % of those who are sexual active, has had sexual relations with another man before 14 years of age (figure 1). Three of four state their sexual orientation as homosexual, 12 men (0,5%) define themselves as heterosexual, and approximately one forth define themselves as bisexual. The bisexual group contains the following sub categories: homosexual partly heterosexual; heterosexual partly homosexual; bisexual; and uncertain. Median age for sexual relations with another man was 17 years (range 10 to more than 50 years), mean 17,9 years +SD 5,7. 84 (3,3 %) reported never having had sex with another man. There were no differences in sexual orientation between the sexual debut groups.



**Figure 1** Distribution of age at sexual debut with another man (in percent), in an internet based study of MSM.

### 5.3 Education, income and employment

There seems to be a difference in education between the sexual debut groups, with a different distribution in lower and higher education. The early debut group has an OR=1,8 [CI 1,2-2,8], for low education defined as primary school or less (less than 9 years of school). OR for a high educated is 0,6 [CI 0,5-0,7], defined as more than 2 years of education after high-school (table 2, 3).

There was no statistical significant difference in income between the groups.

About 70% in both groups was employed. There is a larger proportion of students in the later debut group, and a larger proportion of retired/unemployed/social security takers in the early debut group. OR=1,7 [CI 1,2-2,4] for unemployed/social security/retired for the early debut group (table 2, 3).

**Table 3 Associations between employment, education and sexual debut in MSM respondents in the internet-based cross-sectional study, grouped by sexual debut:**

	Total respondents N (%)	Early debut N (%)	Later debut* <sup>1</sup> N (%)	P-value	OR [95 % CI]
<b>Highly educated</b>				<0,000	0,6 [0,5-0,7]
No	1109 (43,2)	205 (54,5)	849 (40,4)		
Yes	1461 (56,8)	178(46,5)	1254 (59,6)		
Total	2570 (100,0)	383 (100,0)	2103 (100,0)		
<b>Low education</b>				<0,007	1,8 [1,2-2,8]
No	2437 (94,8)	354 (92,4)	2012 (95,2)		
Yes	133 (5,2)	29 (7,6)	91 (4,3)		
Total	2570 (100,0)	383 (100,0)	2103 (100,0)		
<b>Unemployed/social security/retired</b>				<0,002	1,7 [1,2-2,4]
No	2335 (91,2)	333 (87,2)	1929 (92,1)		
Yes	226 (8,8)	49 (12,8)	166 (7,9)		
Total	2561 (100,0)	382 (100,0)	2095 (100,0)		

\*<sup>1</sup> Ref group for univariate logistic regression analyses.

#### 5.4 Sexual behaviour

Sexual behaviour is described in table 4. 79,3% had 11 lifetime partners or more compared to 65,8% among those with a later debut. 7,6 % (early debut) and 3,8 % (later debut) had more than 500 sexual partners. The early debut group reports a higher number of sexual partners. OR for: 10< partners = 2,0 [1,5-2,6], 100< partners = 1,9 [1,5-2,5], 500< partners = 2,1 [1,3-3,3]. There was an association between an early debut and unprotected anal intercourse (UAI) with a casual partner, OR= 1,5 [CI 1,1-2,0] and UAI after dating on the internet OR = 1,5 [CI 1,2-1,9]. No association was found when it comes to unprotected anal intercourse with an anonymous partner and an early sexual debut.

**Table 4 Associations between sexual behaviour and sexual debut in MSM respondents in an internet-based cross-sectional study, grouped by sexual debut:**

	Total respondents N (%)	Early debut N (%)	Later debut* <sup>1</sup> N (%)	P-value	OR [95 % CI]
<b>N of lifetime sexual partners:</b>					
0* <sup>2</sup>	88 (3,4)	1 (0,3)* <sup>2</sup>	5 (0,2)* <sup>2</sup>		
1	70(2,7)	7(1,8)	63(3,0)		
2-5	340(13,2)	28(7,3)	311(14,8)		
6-10	388(15,1)	44(11,5)	344(16,3)		
11-50	888(34,5)	147(38,4)	741(35,2)		
51-100	366(14,2)	55(14,4)	311(14,8)		
101-500	324(12,6)	72(18,8)	242(12,0)		
500<	109(4,2)	29(7,6)	79(3,8)		
<b>Total</b>	<b>2573(100,0)</b>	<b>383(100,0)</b>	<b>2106(100,0)</b>		
<b>Lifetime sex-partners</b>				<0,000	2,0 [1,5-2,6]
<b>10&lt;</b>					
No	798 (32,1)	79 (20,7)	718 (34,2)		
Yes	1687 (67,9)	303 (79,3)	1383 (65,8)		
Total	2485 (100,0)	382 (100,0)	2101 (100,0)		
<b>Lifetime sex-partners</b>				<0,000	1,9 [1,5-2,5]
<b>100&lt;</b>					
No	2052 (82,6)	281 (73,6)	1770 (84,2)		
Yes	433 (17,4)	101 (26,4)	331 (15,8)		
Total	2485 (100,0)	382 (100,0)	2101 (100,0)		
<b>Lifetime sex-partners</b>				<0,001	2,1 [1,3-3,3]
<b>500&lt;</b>					
No	2376 (95,6)	353 (92,4)	2022 (96,2)		
Yes	109 (4,4)	29 (7,6)	79 (3,8)		
Total	2485 (100,0)	382 (100,0)	2101 (100,0)		
<b>UAI with anonymous partner*<sup>3</sup>:</b>				0,1	1,4 [0,9-2,0]
No	515 (68,8)	80 (63,0)	434 (69,9)		
Yes	234 (31,2)	47 (37,0)	187 (30,1)		
Total	1824 (100,0)	127 (100,0)	621 (100,0)		
<b>UAI with casual partner*<sup>3</sup>:</b>				<0,004	1,5 [1,1-2,0]
No	1016 (64,6)	144 (56,7)	871 (66,1)		
Yes	557 (35,4)	110 (43,3)	447 (33,9)		
Total	1573 (100,0)	254 (100,0)	1318 (100,0)		
<b>UAI after dating on the internet</b>				<0,002	1,5 [1,2-1,9]
No	1506 (68,8)	208 (61,5)	1298 (70,2)		
Yes	682 (31,2)	130 (38,5)	551 (29,8)		
Total	2188 (100,0)	338 (100,0)	1849 (100,0)		

\*<sup>1</sup> Ref group for univariate logistic regression analyses.

\*<sup>2</sup> A slightly different number (88) answered no lifetime partners, compared to the sexual debut question (84 with no debut). They are still included in the analysis.

\*<sup>3</sup> Of those who had a casual/anonymous partner the last 6 months.

## 5.5 Self-perceived health

Most of the participants in both groups see their health as good or very good (83,9 %).

Merging the categories into a good, a decent and a poor category there is a difference between the early debut group and the later debut group ( $p=0,002$ ). The early group has an increased odds for poor self-perceived health, OR= 2,6 [CI 1,3-5,2] (table 5).

**Table 5 Self-perceived health among MSM respondents in the internet-based cross-sectional study, grouped by sexual debut:**

	Total respondents N (%)	Early debut N (%)	Later debut* <sup>1</sup> N (%)	P-value	OR [95 % CI]
<b>Self-perceived health:</b>					
Very good	931 (37,7)	134(35,3)	797(38,29)		
Good	1142(46,2)	166(46,7)	975(46,7)		
Decent/average	360(14,6)	68(17,9)	291(13,9)		
Poor	31(1,3)	10(2,6)	21(1,0)		
Very poor	7(0,3)	2(0,5)	5(0,2)		
<b>Total</b>	<b>2471(100,0)</b>	<b>380(100,0)</b>	<b>2089(100,0)</b>		
<b>Poor*<sup>2</sup> self-perceived health:</b>				<0,007	2,6 [1,3- 5,2]
No	2433 (98,5)	368 (96,8)	2063 (98,8)		
Yes	38 (1,5)	12 (3,2)	26 (1,2)		
<b>Total</b>	<b>2471 (100,0)</b>	<b>380 (100,0)</b>	<b>2089 (100,0)</b>		

\*<sup>1</sup> Ref group for univariate logistic regression analyses.

\*<sup>2</sup> Including poor and very poor.

>100 life time sex partners was associated with a poor self-perceived health OR = 2,2 [1,1-4,5]. Feeling drunk more than 7 times a month was associated with a poor self-perceived health OR 2,177 [1,1-4,3]. There was no association on the drugs included in this study and a poor self-perceived health.

## 5.6 HIV

In total 71 participants report their HIV status as positive. About 30 % didn't answer. Of those responding 4,1 % reported themselves as HIV positive. 42 got the HIV diagnosis the last 12 months. In the early debut group 4,3% reported themselves as HIV positive, compared to 3,9% in the later debut group ( $p=0,8$ ). 18,3 % of the HIV positives had their debut before 14 years of age (table 6).

A total of 689 persons said that they never been tested for HIV, about 20% in the early debut group and about 30 % in the later debut (p<0,001). OR for ever taken a HIV test was 1,5 [CI 1,2-2,0].

**Table 6 Self-reported HIV status of MSM respondents in the internet-based cross-sectional study, grouped by sexual debut:**

	Total respondents N (%)	Early debut N (%)	Later debut* <sup>1</sup> N (%)	P-value	OR [95 % CI]
<b>HIV positive</b>				0,8	1,1 [0,6-2,0]
No	1655 (95,9)	281 (95,6)	1372 (95,9)		
Yes	71 (4,1)	13 (4,4)	58 (4,1)		
<b>Total</b>	1726 (100,0)	294 (100,0)	1430 (100,0)		
<b>HIV tested</b>				<0,001	1,5 [1,2-2,0]
No	689 (27,9)	80 (21,1)	609 (29,1)		
Yes	1784 (72,1)	300 (78,9)	1482 (70,9)		
<b>Total</b>	2473 (100,0)	380 (100,0)	2191 (100,0)		

\*<sup>1</sup> Ref group for univariate logistic regression analyses.

In those who had more than 500 lifetime partners 10,6 % was self-reported HIV positive. Comparing  $100 \geq$  and  $101 \leq$  lifetime sexual partners with HIV status gave a higher proportion of HIV+ in those with over 101 partners (p<0,000) (2,1% HIV + vs. 10,1% HIV +).

## 5.7 Alcohol

Alcohol use is described in table 7. The early debut group reports a higher usage of alcohol than the later debut group. In those with an early debut 23,1 % reported feeling “buzzed/intoxicated” more than 7 times last month, 16,7 % in the later debut group (p=0,003). Likewise in the later debut group 38,4 % reported feeling “buzzed/intoxicated” once or less a month, 31,5 % in the early debut group (p=0,01). The early debut group had a higher odds for reporting that alcohol affected their physical OR = 1,8 [CI 1,4-2,3] and mental OR= 1,9 [CI 1,5-2,4] health. A higher percentage of the early debut group wished to reduce their drinking (p=0,002). The early debut group had an OR= 1,8 [CI 1,4-2,3] for unprotected sex while alcohol affected.

**Table 7 Associations between alcohol use and sexual debut age for MSM respondents in an internet-based cross-sectional study, divided by sexual debut:**

	Total respondents N (%)	Early debut N (%)	Later debut* <sup>1</sup> N (%)	P-value	OR [95 % CI]
<b>Alcohol use*<sup>1</sup>, monthly:</b>					
16 times or more	78 (3,0)	13 (3,4)	65 (3,1)		
11-15 times	96(3,7)	18(4,7)	78 (3,7)		
7-10 times	264 (10,3)	57(15,0)	206 (9,9)		
4-6 times	506 (19,7)	93(24,4)	413 (19,8)		
2-3 times	603 (23,4)	80(21,0)	523 (25,1)		
About once	424 (16,5)	51(1,4)	373 (17,9)		
None, or less than once	497 (19,3)	69(18,1)	427 (20,5)		
<b>Total:</b>	<b>2489 (100,0)</b>	<b>383(100,0)</b>	<b>2106 (100,0)</b>		
<b>Alcohol use*<sup>1</sup> 7 times or more a month</b>				<0,003	1,5 [1,1-1,9]
No	2030 (82,3)	293 (76,9)	1736 (83,3)		
Yes	438 (17,7)	88 (23,1)	349 (16,7)		
<b>Total:</b>	<b>2468 (100,0)</b>	<b>381 (100,0)</b>	<b>2085 (100,0)</b>		
<b>Alcohol affected physical health</b>				<0,000	1,8 [1,4-2,3]
No	1904 (78,3)	257 (69,1)	1646 (80,0)		
Yes	527 (21,7)	115 (30,9)	411 (20,0)		
<b>Total</b>	<b>2431 (100,0)</b>	<b>372(100,0)</b>	<b>2057 (100,0)</b>		
<b>Alcohol affected mental health</b>				<0,000	1,9 [1,5-2,4]
No	1992(81,8)	272 (72,7)	1719 (83,6)		
Yes	442 (18,2)	102 (27,3)	339 (16,5)		
<b>Total</b>	<b>2432 (100,0)</b>	<b>374 (100,0)</b>	<b>2058 (100,0)</b>		
<b>Wish to reduce drinking</b>				<0,002	1,6 [1,2-2,1]
No	2237 (86,9)	312 ( 81,5)	1842 (87,5)		
Yes	336 (13,1)	71 (18,5)	264 (12,5)		
<b>Total</b>	<b>2573 (100,0)</b>	<b>383 (100,0)</b>	<b>2106 (100,0)</b>		
<b>UAI while alcohol affected</b>				<0,000	1,8 [1,4-2,3]
No	1773 (73,1)	233 (62,6)	1539 (75,1)		
Yes	651 (26,9)	139 (37,4)	511 ( 24,9)		
<b>Total</b>	<b>2424 (100,0)</b>	<b>372 (100,0)</b>	<b>2050 (100,0)</b>		

\*<sup>1</sup> Ref group for univariate logistic regression analyses.

\*<sup>2</sup> Drinking until feeling intoxicated.

## 5.8 Drug use last 12 months

The participants were asked about their use of marihuana/hash, pharmaceuticals, ecstasy (XTC), LSD, GHB, cocaine, heroin, amphetamine, methamphetamine, “poppers” and Viagra. An association between an early debut and all the drugs above was found. The lowest OR was found for “poppers” OR = 1,4 [CI 1,1 – 1,8], and the highest for methamphetamine OR = 4,4 [CI: 2,2-8,8] (table 8).

The most common used drugs are marihuana/hash, cocaine, amphetamine, “poppers” and Viagra. The early debut group as well had a higher usage of some of the drugs. Having tried hash/marihuana more than 11 times OR=2,1 [CI 1,3-3,3].

The following percentages are for usage more than 10 times in the early debut group: 3,2 % cocaine, 3,5 % amphetamine, XTC 0,8%, LSD 0,5%, GHB 1,1%, heroin 0,5%, methamphetamine 1,1 %. These percentages are about double the percentages for the later debut group.

Out of the 595 who had tried marihuana/hash, 198 had tried it before sex, about 30 % in both groups (p=0,1). 198 had tried cocaine, and 65 of those had tried it before sex (p=0,6). 41,9% (early debut) of those who had tried amphetamine, did it in context of sex, compared to 49,5 % in those with a later debut (p=0,4). 79,1 % of those who had tried poppers, used it in context of sex, compared to 87,9% in those with a later debut (p=0,01).

**Table 8 Associations between drug use last 12 months and sexual debut age for MSM respondents in an internet-based cross-sectional study, grouped by sexual debut:**

	Total respondents N (%)	Early debut N (%)	Later debut* <sup>1</sup> N (%)	P-value	OR (95 % CI)
<b>Tried marihuana/hash</b>				<0,000	1,7 [1,3-2,2]
No	1857 (75,7)	252 (66,7)	1603 (77,3)		
Yes	596 (24,3)	126(33,3)	470 (22,7)		
<b>Total</b>	<b>2453 (100,0)</b>	<b>378(100,0)</b>	<b>2073 (100,0)</b>		
<b>High on pharmaceuticals</b>				<0,000	2,1 [2,5- 3,0]
No	2275 (93,2)	332 (88,3)	1941 (94,1)		
Yes	166 (6,8)	44 (11,7)	122 (5,9)		
<b>Total</b>	<b>2441 (100,0)</b>	<b>376(100,0)</b>	<b>2063 (100,0)</b>		
<b>Tried GHB</b>				<0,000	2,8 [1,6-4,7]
No	2382 (97,3)	355 (94,2)	2025 (97,8)		
Yes	67 (2,7)	22 (5,8)	45 (2,2)		
<b>Total</b>	<b>2449 (100,0)</b>	<b>377(100,0)</b>	<b>2070(100,0)</b>		
<b>Tried XTC*<sup>2</sup></b>				<0,001	2,2 [1,4-3,5]
No	2347 (96,2)	349 (93,1)	1996 (96,8)		
Yes	93 (3,6)	26 (6,9)	67 (3,2)		
<b>Total</b>	<b>2440 (100,0)</b>	<b>375(100,0)</b>	<b>2063(100,0)</b>		
<b>Tried LSD</b>				<0,02	3,3 [1,2-9,3]
No	2420 (99,3)	367 (98,4)	2051 (99,5)		
Yes	16 (0,7)	6 (1,6)	10(0,5)		
<b>Total</b>	<b>2436 (100,0)</b>	<b>373(100,0)</b>	<b>2061(100,0)</b>		
<b>Tried Cocaine</b>				<0,006	1,6 [1,2-2,3]
No	2244 (91,9)	331 (88,3)	1911 (92,5)		
Yes	198 (8,1)	44 (11,7)	154 (7,5)		
<b>Total</b>	<b>2442 (100,0)</b>	<b>375 (100,0)</b>	<b>2065 (100,0)</b>		
<b>Tried Heroine</b>				<0,007	3,4 [1,4-8,3]
No	2419 (99,1)	368 (97,9)	2049 (99,4)		
Yes	21 (0,9)	8 (2,1)	13 (0,6)		
<b>Total</b>	<b>2440 (100,0)</b>	<b>376 (100,0)</b>	<b>2062 (100,0)</b>		
<b>Tried Amphetamine</b>				<0,000	2,4 [1,7-3,5]
No	2291(93,9)	332 (88,5)	1957 (94,9)		
Yes	148(6,1)	43 (11,5)	105 (5,1)		
<b>Total</b>	<b>2439(100,0)</b>	<b>375 (100,0)</b>	<b>2062 (100,0)</b>		
<b>Tried Methamphetamine</b>				<0,000	4,4 [2,2-8,8]
No	2393 (98,6)	360 (96,0)	2031 (99,1)		
Yes	34 (1,4)	15 (4,0)	19(0,9)		
<b>Total</b>	<b>2427 (100,0)</b>	<b>375 (100,0)</b>	<b>2050 (100,0)</b>		
<b>Tried "Poppers"</b>				<0,002	1,4 [1,1-1,8]
No	1770 (72,3)	249 (65,9)	1520 (73,5)		
Yes	678 (27,7)	129 (34,1)	548(26,5)		
<b>Total</b>	<b>2448 (100,0)</b>	<b>378 (100,0)</b>	<b>2068 (100,0)</b>		
<b>Tried Viagra</b>				<0,004	1,6 [1,1-3,2]
No	2155 (88,2)	314 (83,7)	1839 (89,0)		
Yes	289 (11,8)	61 (16,3)	228 (11,0)		
<b>Total</b>	<b>2444 (100,0)</b>	<b>375 (100,0)</b>	<b>2067 (100,0)</b>		

\*<sup>1</sup> Ref group for univariate logistic regression analyses.

\*<sup>2</sup> XTC = Ecstasy

## **6.0 Discussion**

Mean age among the participants was 32,4 years. Most of the participants live in Norway, where about half lives in or around Oslo. 93 % count their cultural background as Norwegian. 50 % lives alone. Half the population has a higher education, compared to about 30 % in the general population in 2011. 70 % is employed, compared to 63 % in the general population (22). A large part has a high income (over 500 000 NOK). Thus it seems like the participants represent a highly educated part of the society.

### **Sexual debut and sexual orientation**

The median sexual debut in this survey was 17 years. There are few Norwegian data on this theme. The Norwegian report on sexual behaviour of 2002, had a mean of 15 years for MSM. The median sexual debut age for heterosexuals was 17,5 for men and 17,1 years for women in 2002, respondents was between 18 and 22 years old (2). Thus there seems like the mean sexual debut age in our survey is quite similar to the heterosexual Norwegian population of 2002. A Swiss study finds a median age at fist anal intercourse of 21 years (13). An Australian study finds a median AFAI of 35 years for men born between 1944 1953 (oldest age cohort) and 18 years for men born between 1984 and 1993 (youngest age cohort) (10). In a Scandinavian study on young age at first intercourse and risk taking behaviours in women 11,6 % had an early debut (defined as 14 years or younger) (23), compared to 15,4% in our results (with a lower age defined as early debut). Three of four state their sexual orientation as homosexual and approximately one fourth define themselves as bisexual (or uncertain), no differences was found on sexual orientation and sexual debut in this study.

### **Education, income and employment**

The early sexual debut group seems to be less educated compared to the later sexual debut group, with a higher part of persons who have not completed more than primary school. A Swedish study associates an early debut (in teenagers) with less positive school experiences (4). There was slightly no difference in income. Though the percentage of employed persons was similar, there was a difference in students/military/civil service and unemployed/social-security/retired persons. An early debut was associated with being in unemployed/retired/social-security takers. The later debut group had a higher percentage of students.

## **Sexual behaviour**

In the Norwegian report on sexual behaviour of 2002 median number of sexual partners for single men was 7, median 6 for single women. Median among those living with a partner was 6 for men, 4 for women. 33,4 % of single men had more than 11 lifetime partners, 27,1 % in single women (2). Our result shows a higher number of life-time sexual partners for both the group with an early debut and that with a later. The early debut group has almost three times as many participants with more than 11 lifetime partners compared to the general population. An American study finds more lifetime partners among gay and bisexual male youths (in New York) compare to the heterosexual youths, and a mean number of lifetime partners of 17,6 compared to 5,5 (among the heterosexual youth population) (24). A Scandinavian study on young age at first intercourse and risk-taking behaviours in women found that the adjusted OR of reporting more than 10 lifetime sexual partners was almost 4 times higher among those with an early debut (14 years and younger) than those with a later debut (15 years and older) (23).

We found an association between an early debut and unprotected anal intercourse (UAI) with a casual partner, but not with an anonymous partner. An anonymous partner meaning someone you don't know the identity of, and a casual partner meaning that you know the person (but don't have a steady relationship with). One might think that having UAI with a partner you don't know is taking a higher risk than with a casual partner. A Swiss study found a positively and linearly association between age at first anal intercourse and condom use, with a higher probability of unprotected intercourse with a younger age at first anal intercourse (13).

## **HIV**

Other studies have reported an association between an early sexual debut and HIV infection (10). There are 71 self-reported HIV positives in this survey, about 4 % of those who gave an answer. No significant differences between HIV status and sexual debut age were found.

About 30 % in our study has never take a HIV test, thus it seems like a large part of this high-risk population doesn't know their HIV status. Similar results is found in another Norwegian survey, where more than a third never received the answer for a HIV test (25). 9 MSM got the HIV diagnosis at the same time as their AIDS diagnosis in 2012, and 14 had an advanced HIV

infection when they were tested for HIV. This means that probably more MSM in Norway has an undiagnosed HIV infection, and that increased information on testing is needed (15).

We found an association between self-reported HIV prevalence and life time sexual partners, with an increasing prevalence of HIV with numbers of sexual partners. Similar results are reported in other studies (19). Though the early debut group has a higher number of lifetime sexual partners, there was not found any association with HIV status. Participants in the early sexual debut group seem to HIV-test themselves more than the later debut group. Good insight of their increased risk for infection with numerous sex- partners and a lower threshold for HIV testing can be an explanation that no difference was found on sexual debut and HIV status.

### **Alcohol and drugs**

Those with an early debut have fewer with a low alcohol consumption and a higher percentage of high consumers compared to those with a later debut. Several studies report a high prevalence of drugs and alcohol use among the MSM population (7, 26). Woolf and Maistro reported a possible association between heavy episodic drinking among MSM and sexual risk behaviour (26). Early intercourse debut may also be a pattern of problem behaviour, wherein alcohol intoxication is an important predictor for both genders (27). There are more participants in the early debut group that feel their mental and physical health is influenced by their alcohol consumption, and more of them want to reduce their drinking. This is an expected result since there is a higher usage of alcohol in this group.

Though the early debut group had significantly higher odds for trying the drugs implemented in this study, some of the sub-groups are quite small. One of the most common tried drugs (marihuana/hash) was also the one with the lowest odds ratio, meaning that marihuana/hash is quite common in both groups. There may be a minor part of the early debut group that has a much higher drug use compared to the others, this might be an interesting sub-group for further research.

An American study find an association between drug and alcohol use and high-risk sexual behaviour among MSM, with the thesis that it may help men to avoid feelings of anxiety associated with same-sex behaviour and self-awareness of HIV risk (7). Several of the drugs included in our study were commonly used in context of sex, though there was no difference

between the sexual debut groups. Using drugs was highly associated with an early sexual debut.

Though most respondents perceive their health as good or decent, those with an early debut have as well a higher part that perceive their health as poor or decent, compared to a higher part that perceive their health as good in those with a later debut.

### **Study limitation**

Results from this study cannot be generalized or transferred from this population to the general MSM population in Norway. Internet-based surveys may provide an easy and low cost tool to reach a part of the MSM population. Those who use the internet to seek for sex seems to have increased levels of high risk sexual behaviour and sexually transmitted infections (28). Result from this study thus describes those of the MSM population that uses internet for sex seeking behaviour.

In the sexual debut age question, the lowest possible answer was 10 years. Knowing that sexual relations between older men and young boys are common in such communities, they probably should have been able to submit younger age at debut. We thus are assuming that if there were any with a younger debut, they have probably answered 10 years. Other studies report that many young MSM had their sexual debut with an older adult man, bringing into question the voluntary nature of the experience, which could be interesting for future studies. For alcohol consumption the question was on feeling intoxicated. This is a very subjective description, and one can assume that the relative amount of beverage would differ a lot between respondents. It might have been useful to ask more specific about amounts to determine specific usage.

Multiple responses were possible, but were unlikely as it took about 40 minutes to complete the questionnaire.

There was a great age difference in the population and possible recall bias may exist, especially among the older participants.

Some of the participants have answered yes to use of heroine, and thus the usage of intravenous drugs are possible. HIV infected in this survey could therefore have obtained their infection by intravenous drug use or heterosexual intercourse.

In this 5<sup>th</sup> year assignment (due to limited time) the analyses are limited to univariate logistic regression.

In conclusion, though the MSM respondents in this internet survey are more educated than the general population, an increased risk of being under-educated and unemployed/retired/social-security taker was found in the early sexual debut group. We also found an association with numerous sexual partners, unprotected anal intercourse, and usage of alcohol and drugs in this group. Our results show an association between an early sexual debut and a poorer health outcome among MSM in this Norwegian internet study.

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