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# Risk factors of having cholecystectomy for gallstone disease in a prospective population-based cohort study

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**Table 1.** Baseline characteristics of the study population

	Women			Men		
	Controls No. (%)	Cases No. (%)	<i>P</i>	Controls No. (%)	Cases No. (%)	<i>P</i>
<b>All participants</b>	<b>32,454 (100)</b>	<b>813 (100)</b>		<b>29,633 (100)</b>	<b>349 (100)</b>	
<b>Age</b>						
<30	4,408 (13.6)	120 (14.8)	<0.001	3,982 (13.4)	19 (5.4)	<0.001
30-39	5,779 (17.8)	136 (16.7)		5,349 (18.1)	45 (12.9)	
40-49	6,799 (20.9)	185 (22.8)		6,398 (21.6)	76 (21.8)	
50-59	5,434 (16.7)	186 (22.9)		5,197 (17.5)	80 (22.9)	
60-69	4,446 (13.7)	128 (15.7)		4,186 (14.1)	74 (21.2)	
70-79	4,129 (12.7)	53 (6.5)		3,489 (11.8)	53 (15.2)	
80+	1,459 (4.5)	5 (0.6)		1,032 (3.5)	2 (0.6)	
<b>Body mass index</b>						
Normal	14,595 (45.0)	223 (27.4)	<0.001	10,449 (35.3)	61 (17.5)	<0.001
Overweight	11,977 (36.9)	341 (41.9)		14,963 (50.5)	194 (55.6)	
Obese	5,882 (18.1)	249 (30.6)		4,221 (14.2)	94 (26.9)	
<b>Waist Circumference</b>						
Normal	15,816 (48.7)	241 (29.6)	<0.001	17,880 (60.3)	139 (39.8)	<0.001
Increased	7,917 (24.4)	224 (27.6)		7,645 (25.8)	125 (35.8)	
Subst. increased	8,721 (26.9)	348 (42.8)		4,108 (13.9)	85 (24.4)	
<b>Highest educational level</b>						
Primary school	12,457 (38.4)	322 (39.6)	0.015	9,111 (30.7)	118 (33.8)	0.240
High school	8,770 (27.0)	253 (31.1)		11,289 (38.1)	130 (37.2)	
Junior college	3,202 (9.9)	74 (9.1)		2,254 (7.6)	18 (5.2)	
University	6,151 (19.0)	123 (15.1)		5,631 (19.0)	64 (18.3)	
Missing	1,874 (5.8)	41 (5.0)		1,348 (4.5)	19 (5.4)	
<b>Hard physical activity</b>						
<1 hour/week	14,939 (46.0)	421 (51.8)	<0.001	13,300 (44.9)	170 (67.7)	0.012
1+ hours/week	6,220 (19.2)	118 (14.5)		8,883 (30.0)	81 (32.3)	
Missing	11,295 (34.8)	274 (33.7)		7,450 (25.1)	98 (28.1)	
<b>Parity</b>						
None	3,872 (11.9)	68 (8.4)	0.014			
1-2 children	12,080 (37.2)	323 (39.7)				
3+ children	12,062 (37.2)	323 (39.7)				
Missing	4,440 (13.7)	99 (12.2)				
<b>Hormone replacement therapy use</b>						
Never used	20,412 (62.7)	470 (57.8)	<0.001			
Former user	1,231 (3.8)	45 (5.5)				
Currently using	2,558 (7.9)	117 (14.4)				
Missing	8,253 (25.4)	181 (22.3)				
<b>Ever used contraceptive medication</b>						
No	9,952 (30.7)	303 (37.3)	0.180			
Yes	12,585 (38.8)	344 (42.3)				
Missing	9,917 (30.6)	166 (20.4)				

**Table 2.** Univariable analyses of risk factors for cholecystectomy

	<b>Women</b>			<b>Men</b>		
	No.	HR (95% CI)*	<i>P</i>	No.	HR (95% CI)*	<i>P</i>
<b>Age</b>						
<30	4,528	1(reference)		4,001	1(reference)	
30-39	5,915	0.87(0.68-1.11)	0.255	5,394	1.76(1.03-3.01)	0.039
40-49	6,984	1.00(0.80-1.26)	0.991	6,474	2.49(1.50-4.11)	<0.001
50-59	5,620	1.26(1.00-1.59)	0.049	5,277	3.24(1.97-5.34)	<0.001
60-69	4,574	1.08(0.84-1.38)	0.554	4,260	3.79(2.29-6.27)	<0.001
70-79	4,182	0.50(0.36-0.69)	<0.001	3,542	3.34(1.98-5.65)	<0.001
80+	1,464	0.13(0.05-0.33)	<0.001	1,034	0.42(0.10-1.80)	0.241
<b>Body mass index</b>						
Normal	14,818	1(reference)		10,510	1(reference)	
Overweight	12,318	1.86(1.57-2.21)	<0.001	15,157	2.22(1.67-2.96)	<0.001
Obese	6,131	2.77(2.31-3.32)	<0.001	4,315	3.81(2.76-5.26)	<0.001
<b>Waist Circumference</b>						
Normal	16,057	1(reference)		18,019	1(reference)	
Increased	8,141	1.86(1.55-2.23)	<0.001	7,770	2.12(1.66-2.70)	<0.001
Subst. increased	9,069	2.63(2.23-3.10)	<0.001	4,193	2.70(2.06-3.53)	<0.001
<b>Educational level</b>						
Primary school	12,779	1(reference)		9,229	1(reference)	
High school	9,023	1.10(0.93-1.30)	0.262	11,419	0.88(0.69-1.13)	0.307
Junior college	3,276	0.88(0.68-1.13)	0.322	2,272	0.61(0.37-1.00)	0.050
University	6,274	0.77(0.62-0.94)	0.011	5,695	0.87(0.64-1.18)	0.362
<b>Hard physical activity</b>						
<1 hour/week	15,360	1(reference)		13,470	1(reference)	
1+ hours/week	6,338	0.67(0.55-0.82)	<0.001	8,964	0.71(0.55-0.93)	0.011

\*Hazard ratio (95 per cent confidence interval)

**Table 3.** Multivariable analysis of risk factors for cholecystectomy

	<b>Women</b>			<b>Men</b>		
	No.	HR (95% CI)*	<i>P</i>	No.	HR (95% CI)*	<i>P</i>
<b>Age</b>						
<30	3,296	1(reference)		3,578	1(reference)	
30-39	4,059	0.77(0.55-1.07)	0.128	4,657	1.36(0.77-2.39)	0.289
40-49	4,154	0.69(0.48-0.98)	0.036	5,250	1.85(1.08-3.16)	0.025
50-59	2,686	0.56(0.37-0.86)	0.007	3,858	2.30(1.33-3.98)	0.003
60-69	1,355	0.52(0.32-0.84)	0.008	2,497	2.69(1.51-4.79)	<0.001
70-79	993	0.18(0.09-0.37)	<0.001	1,686	2.92(1.58-5.41)	<0.001
80+	343	0.11(0.03-0.46)	0.002	449	0.72(0.16-3.18)	0.667
<b>Body mass index</b>						
Normal	8,346	1(reference)		7,910	1(reference)	
Overweight	5,946	1.58(1.19-2.10)	0.002	11,047	1.58(1.10-2.30)	0.014
Obese	2,594	1.96(1.33-2.87)	<0.001	3,018	2.02(1.22-3.37)	0.007
<b>Waist Circumference</b>						
Normal	9,261	1(reference)		13,840	1(reference)	
Increased	3,937	1.38(1.03-1.85)	0.029	5,395	1.55(1.12-2.15)	0.009
Subst. increased	3,688	1.72(1.22-2.43)	0.002	2,740	1.51(0.96-2.39)	0.076
<b>Educational level</b>						
Primary school	4,841	1(reference)		5,973	1(reference)	
High school	5,288	0.93(0.73-1.20)	0.584	8,977	1.15(0.84-1.58)	0.373
Junior college	2,293	0.72(0.50-1.04)	0.083	1,966	1.07(0.60-1.91)	0.826
University	4,464	0.64(0.48-0.87)	0.004	5,059	1.21(0.84-1.75)	0.293
<b>Hard physical activity</b>						
<1 hour/week	11,665	1(reference)		13,147	1(reference)	
1+ hours/week	5,221	0.74(0.59-0.94)	0.012	8,828	0.81(0.62-1.06)	0.124
<b>Parity</b>						
None	2,749	1(reference)				
1-2 children	7,762	1.47(1.04-2.07)	0.028			
3+ children	6,375	1.21(0.83-1.75)	0.329			
<b>Hormone replacement therapy use</b>						
Never used	14,443	1(reference)				
Former user	814	1.97(1.37-2.85)	<0.001			
Currently using	1,629	2.30(1.73-3.07)	<0.001			

\*Hazard ratio (95 per cent confidence interval)

# Nord-Trøndelag

**Figure 1.** The HUNT Study area, the 24 municipalities in Nord-Trøndelag County, Norway

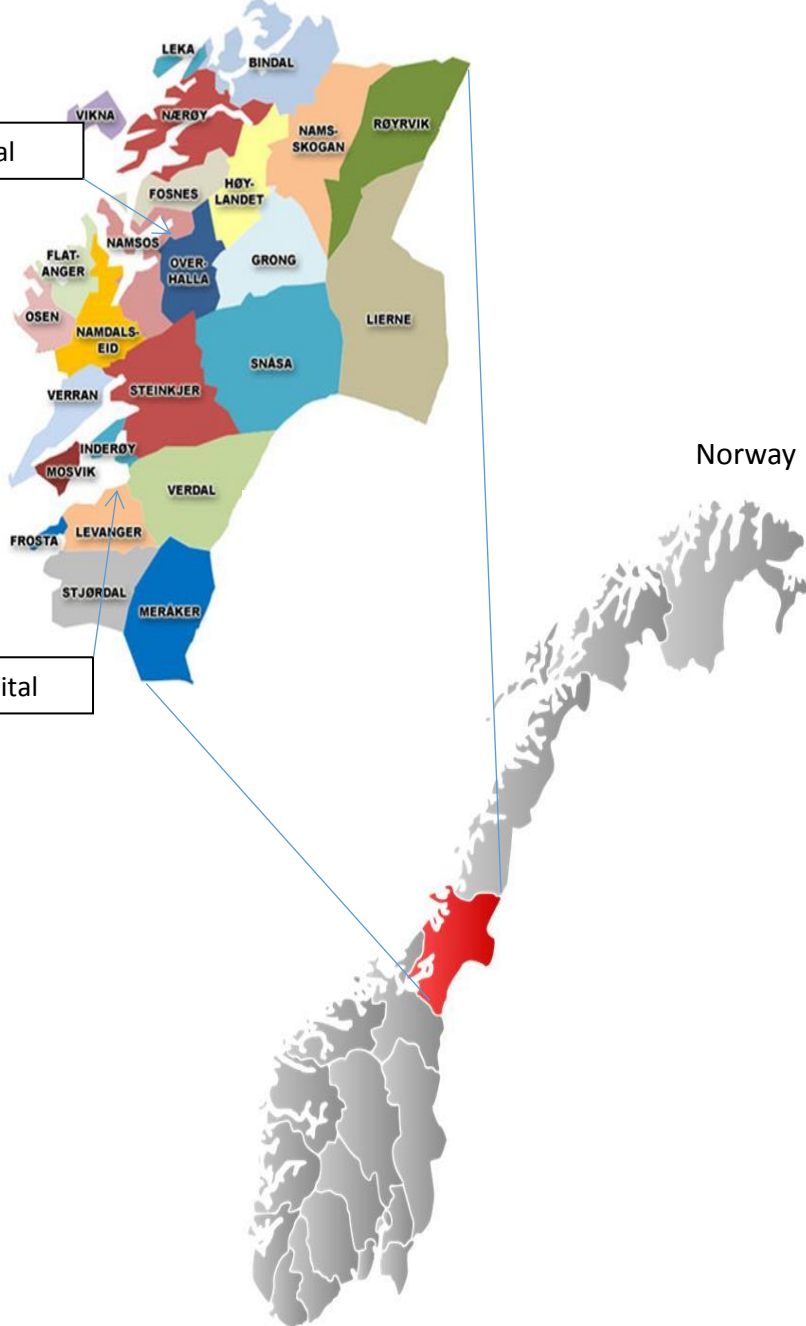
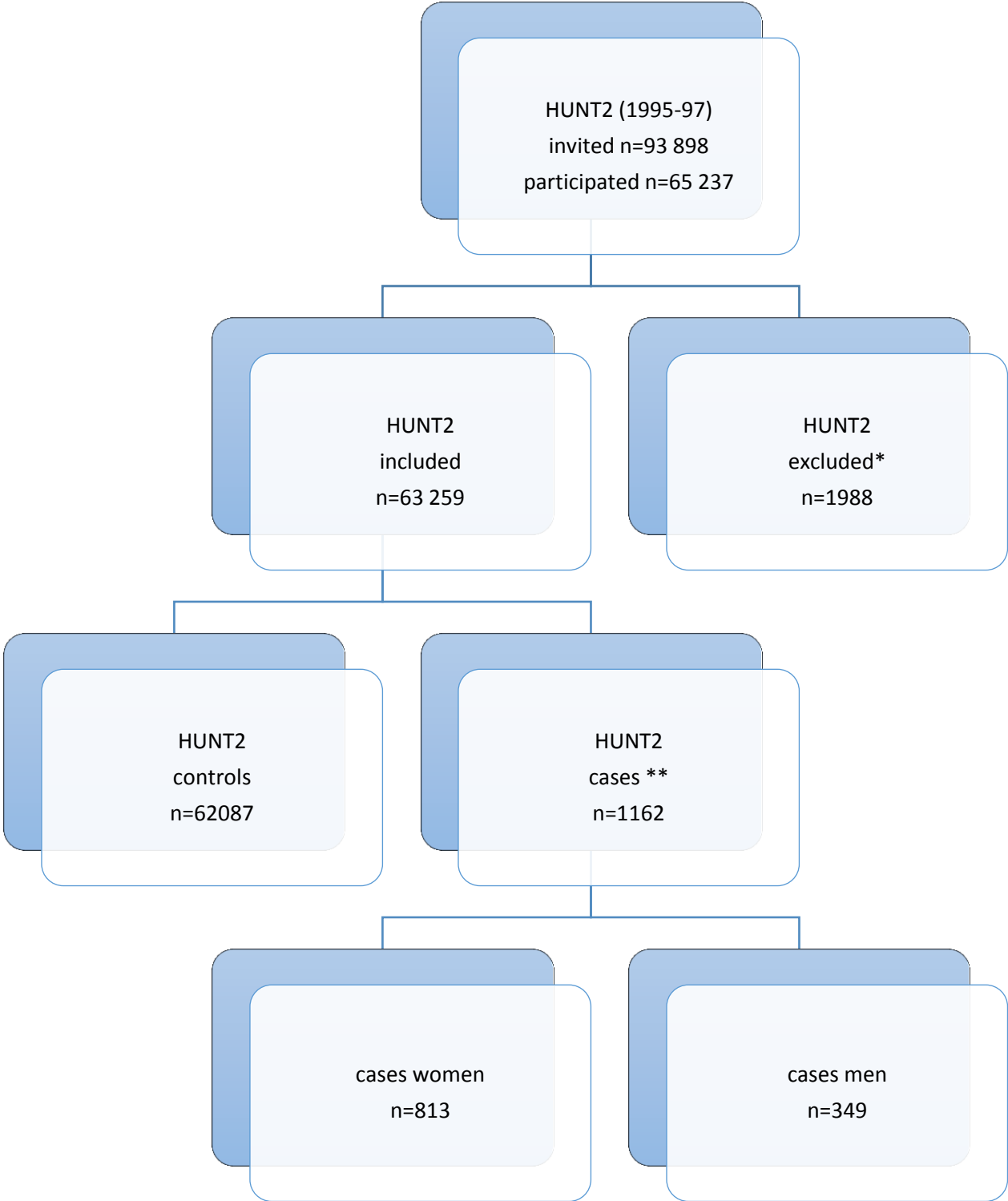


Figure 2. Flowchart of patient inclusion



\*exclusion criteria: not completed health questionnaire, not registered height and/or weight.

\*\*1841 persons were operated in the time period. 1162 (63.1 per cent) participated in HUNT2