### Supplementary tables

**Supplementary table 1** Incidence rate ratio's (IRR) and confidence intervals (CI) from Poisson regression on the imputed data.

| | Working in a cold environment <25% of the time n=4247 | Working in a cold environment ≥25% of time n=632 |
|---|---|---|
| | Ref. | Crude<sup>a</sup> | Fully adjusted<sup>b</sup> |
| | IRR | CI | IRR | CI |
| Any MSC | - | 1.14 | 1.05 | 1.23 | 1.12 | 1.03 | 1.22 |
| Severe MSC | - | 1.14 | 0.82 | 1.60 | 0.98 | 0.69 | 1.39 |
| MSC in ≥3 anatomical regions | - | 1.28 | 1.06 | 1.56 | 1.07 | 0.88 | 1.30 |

<sup>a</sup> Adjusted for age, sex, and number of MSC in Tromsø 6. Interaction term between working in a cold environment ≥25% of time and severe MSC/MSC in ≥3 anatomical regions.

<sup>b</sup> Adjusted for age, sex, number of moderate MSC, education, physical activity at work, smoking status, body mass index, and self-reported health at Tromsø 6. Interaction term between working in a cold environment ≥25% of time and severe MSC/MSC in ≥3 anatomical regions.

MSC=musculoskeletal complaints
Supplementary table 2 Sensitivity analysis for any musculoskeletal complaints (MSC), severe MSC, and MSC in ≥3 anatomical regions. Three different approaches are shown: a logistic regression, logistic regression adjusted for the 10 major occupational groups in the Norwegian version of the International Standard Classification of Occupations 88 (ISCO-88), and a model with a random intercept for each 4-digit occupational code. The odds ratio (OR), confidence intervals (CI) and Akaike information criterion (AIC) are shown for each model.

| n=1982                          |                  |                  |      |                  |                  |      |                  |                  |
|---------------------------------|------------------|------------------|------|------------------|------------------|------|------------------|------------------|
|                                 | Crude\(^a\)      | Fully adjusted model\(^b\) |
|                                 | OR               | CI               | AIC  | OR               | CI               | AIC  |
| Any MSC                         |                  |                  |      |                  |                  |      |                  |                  |
| Logistic model                  | 1.69             | 1.22             | 2.32 | 1.79             | 1.23             | 2.60 | 2578             | 2566             |
| Logistic model adjusted for the 10 major occupational groups | 1.52 | 1.07 | 2.16 | 1.73 | 1.17 | 2.54 | 2589 | 2579 |
| Mixed-effects logistic model with 4-digit occupational code | 1.66 | 1.20 | 2.31 | 1.79 | 1.22 | 2.61 | 2580 | 2568 |
| Severe MSC                      |                  |                  |      |                  |                  |      |                  |                  |
| Logistic model                  | 1.46             | 0.90             | 2.36 | 1.18             | 0.66             | 2.12 | 1079             | 1065             |
| Logistic model adjusted for the 10 major occupational groups | 1.03 | 0.60 | 1.76 | 1.06 | 0.58 | 1.95 | 1082 | 1070 |
| Mixed-effects logistic model with 4-digit occupational code | 1.46 | 0.90 | 2.36 | 1.18 | 0.66 | 2.12 | 1079 | 1065 |
| MSC in ≥3 anatomical regions    |                  |                  |      |                  |                  |      |                  |                  |
| Logistic model                  | 1.71             | 1.16             | 2.51 | 1.43             | 0.93             | 2.21 | 1725             | 1714             |
| Logistic model adjusted for the 10 major occupational groups | 1.69 | 1.17 | 2.43 | 1.43 | 0.93 | 2.21 | 1725 | 1714 |
| Mixed-effects logistic model with 4-digit occupational code | 1.40 | 0.93 | 2.10 | 1.45 | 0.93 | 2.27 | 1724 | 1722 |

\(^{a}\) Adjusted for age and number of moderate MSC at Tromsø 6.

\(^{b}\) Adjusted for age, number of moderate MSC, education, physical activity at work, smoking status, body mass index, and self-reported health at baseline.
### Supplementary table 3 Occupations for which participants reported to work 25% of the time in cold environment at the time of Tromsø 6. Sorted by frequency of workers in the occupation.

| Occupation                                                                 | Working in a cold environment ≥25% of the time |
|---------------------------------------------------------------------------|-----------------------------------------------|
| Child-care workers                                                        | 21                                            |
| Carpenters and joiners                                                   | 13                                            |
| Stock clerks                                                             | 10                                            |
| Road workers and construction workers                                     | 10                                            |
| Earth-moving and related plant operators                                 | 8                                             |
| Mail carriers and sorting clerks                                         | 7                                             |
| Fishery workers                                                          | 7                                             |
| Ships deck officers and pilots                                           | 6                                             |
| Fish-processing-machine operators                                        | 5                                             |
| Pre-primary education teaching associate professionals                    | 5                                             |
| Electricians, electrical and electronic equipment mechanics and fitters  | 5                                             |
| Civil engineering technicians                                            | 4                                             |
| Helpers and cleaners in offices and other establishments                 | 4                                             |
| Directors and chief executives                                           | 3                                             |
| Nursing assistants and care                                              | 3                                             |
| Shop salespersons and other salespersons (retail)                         | 3                                             |
| Dairy and livestock producers                                            | 3                                             |
| Welders                                                                   | 3                                             |
| Motor vehicle mechanics and fitters                                      | 3                                             |
| Aircraft engine mechanics and fitters                                    | 3                                             |
| Electrical line installers, repairers, and cable jointers                | 3                                             |
| Heavy truck and lorry drivers                                           | 3                                             |
| Shipsdeck crews                                                          | 3                                             |
| Labourers in construction and maintenance, etc.                          | 3                                             |
| Officers (above the rank of captain)                                     | 2                                             |
| Other public service administrative associate professionals              | 2                                             |
| Police officers                                                           | 2                                             |
| Clerical officers                                                         | 2                                             |
| Caretakers                                                                | 2                                             |
| Bricklayers and stonemasons                                              | 2                                             |
| Concrete workers and site labourers                                      | 2                                             |
| Telegraph and telephone installers and servicers                          | 2                                             |
| Bus- and tram drivers                                                    | 2                                             |
| Garbage collectors and related labourers                                  | 2                                             |
| Production and operations department managers in manufacturing, mining and quarrying, electricity, gas and water supply | 1                                             |
| Production and operations department managers in education, health and social security | 1                                             |
| Production and operations department managers in personal care, cleaning and related services | 1                                             |
| Supply and distribution department managers                              | 1                                             |
| Other department managers not elsewhere classified                        | 1                                             |
| Occupation                                                                 | Count |
|---------------------------------------------------------------------------|-------|
| Transport clerks                                                          | 1     |
| General managers in construction                                          | 1     |
| General managers in wholesale and retail trade                            | 1     |
| General managers in business services                                     | 1     |
| Mining engineers, metallurgists, and related professionals                | 1     |
| Biologists, botanists, zoologists, and related professionals              | 1     |
| Nursing and midwifery professionals                                       | 1     |
| Secondary education teaching professionals                                 | 1     |
| Other public service administrative professionals                          | 1     |
| Electrical engineering technicians                                        | 1     |
| Electronics and telecommunications engineering technicians                  | 1     |
| Oil, mining and metallurgical technicians                                 | 1     |
| Fire inspectors                                                           | 1     |
| Nurses                                                                    | 1     |
| Primary education teaching associate professionals                         | 1     |
| Estate agents                                                             | 1     |
| Technical and commercial sales representatives                            | 1     |
| Appraisers, valuers, and auctioneers                                      | 1     |
| Bank associate professionals                                              | 1     |
| Athletes, sportspersons and coaches                                       | 1     |
| Radio and television announcers                                           | 1     |
| Transport clerks                                                          | 1     |
| Dentists secretaries                                                      | 1     |
| Fire-fighters                                                             | 1     |
| Salespersons (wholesale)                                                  | 1     |
| Fish farmers, etc.                                                        | 1     |
| Plumbers                                                                  | 1     |
| Painters and related workers                                               | 1     |
| Chimney sweepers                                                          | 1     |
| Tinsmiths, etc.                                                           | 1     |
| Industrial mechanics and fitters                                          | 1     |
| Technical illustrators                                                    | 1     |
| Oil- and gas-processing-plant operators                                   | 1     |
| Fishing tackles-machine operators                                         | 1     |
| Car, taxi, and van drivers                                                | 1     |
| Labourers in manufacturing                                                | 1     |
| Storing and goods handling labourers                                      | 1     |