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Cohort Profile

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# Cohort Profile: The Danish Conscription Database(DCD): A cohort of 728 160 men born from 1939 through 1959

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## Abstract

The Danish Conscription Database (DCD) was established to enable studies of the influence of early physical and mental exposures on adverse health and social outcomes from a life-course perspective. In Denmark, all young men are requested to appear before the conscription board when they turn 18 years, to be assessed for military service. The DCD was established by digitizing information from conscription board register cards on the height, weight, educational level, intelligence test score and examination details of Danish conscripts. The DCD contains information on 728 160 men born from 1939 through 1959 and examined by the conscription board from 1957 through 1984. The unique Danish personal identification number of each individual conscript has been traced, and this allows linkage of the DCD to all Danish health and socioeconomic registers. More than 130 000 deaths have been identified in a recent linkage to the Danish Register of Cause of Death. We encourage collaboration, and interested researchers should contact: danishconscriptiondatabase.glostrup-hospital@regionh.dk.

**Key Messages**

- The DCD is a unique, nationwide, population-based cohort with more than 24 million person-years of follow-up for mortality by the end of 2010.
- Consistent with the Flynn effect, a steady increase in intelligence test score was found across the birth years from 1940 through 1959.
- Analysis on the DCD also showed that mean height increased from 174.6 cm to 179.1 cm across birth years from the same period.
- Height and intelligence were both inversely associated with all-cause mortality, and these associations were consistent across birth cohorts from 1939 through 1959.

## Why was the cohort set up?

The health of an individual is shaped throughout life, and exposures in childhood and early adulthood (e.g. psychosocial deprivation, education and lifestyle) may influence the risk of later adverse health outcomes and survival.[1] To explore the effects of early-life characteristics, longitudinal cohort studies including information from early life are needed. Unfortunately, most cohort studies which include this kind of information are based on either small or relatively young study populations. The Danish Conscription Database (DCD) is based on physical and psychological tests from conscription board examinations of 728 160 young Danish men born from 1939 through 1959. Conscription is compulsory for all young men in Denmark, as it has been in Norway and Sweden, and usually takes place at the age of 18–20 years. Conscription involves a health examination of the conscripts, and data include height, weight, educational level, and cognitive ability assessed by an intelligence test.

Recognizing this valuable source of information, conscription cohorts have been established in Sweden and Norway, and now also in Denmark. The Swedish and Norwegian conscription cohorts are both large cohorts ($n = 1\ 442\ 923$ and $n = 1\ 006\ 681$, respectively), including men born predominantly from 1950 and onwards (Sweden: born 1950–81, Norway: born 1950–85).[2,3] In Denmark, as in other Nordic countries, all residents have a unique personal identification number (the Central Personal Registration number or CPR-number) which creates exceptional opportunities for register-based research. The Swedish and Norwegian conscription cohorts have been linked to registers in their respective countries and have formed the basis of a large number of papers which have contributed important new knowledge on the effect of factors in early adult life on morbidity and mortality.[4,5] The Danish national health and socioeconomic registers are extremely rich in individual-level data on the Danish population and were established relatively early, e.g. cancer and cause-specific death incidence since the 1940s[6,7] and hospitalizations since the 1970s,[8] as well as some data on individual characteristics (e.g. marital status) from 1968 through the Danish Civil Registration System (CPR).[9]

On the other hand, there is generally a lack of data on early-life characteristics and the establishment of the DCD will help to fill some of this gap. Data from conscription board examinations have in Denmark been recorded in a standardized format on register cards since 1957, and by digitizing these cards we have created a large-scale conscription cohort with a potential for follow-up over a long period by linkage to the national registers. This makes it particularly suited to investigations of the effect of individual characteristics measured in young adulthood on later health and survival. Of particular interest is the availability of data on height, weight and intelligence assessed in youth in a large population. During the past two decades, several studies have consistently shown an association between either high body mass index or low intelligence test score measured in childhood or young adulthood, and increased risk of morbidity and mortality.[10–13] However, the factors which contribute to these associations are not fully understood yet. Through linkage to the Danish health and socioeconomic registers, the DCD will create new opportunities to further explore how height, weight and intelligence measured in early adult life influence later morbidity and mortality. Given that the DCD covers 21 birth cohorts, it is also a unique resource for studies of trends over time and of geographical differences in these physical and mental characteristics.

## Who is in the cohort?

In 1957 an intelligence test, the BørgePriensPrøve (BPP), was included in the conscription board examination, and register cards were introduced replacing the earlier conscription books. Consequently, it was decided to digitize

21 birth cohorts, covering men born from 1939 through 1959. The establishment of the DCD can be divided into three phases, described below and illustrated in Figure 1.

## Phase 1: conscription board examination

The Danish conscription board examinations are conducted according to national guidelines to ensure identical procedures across the country. All Danish men are requested at age 18 to appear before the conscription board for an examination of their physical and mental capabilities. Officially, the conscription board examination can be postponed until age 26 years, and most men (77%) are examined when they are 18–20 years of age. However, a few are re-examined in their late 20 s or early 30 s if their suitability for military service is questioned.[14] Boys volunteering for military service before their 18th birthday and men who, due to medical conditions (e.g. mental retardation, epilepsy), are unfit for military service are exempted from appearing before the conscription board.[14] Exempts are generally registered with personal identification details and no examination data by the conscript board. The proportion of exempts has been reported to be 5–10% of a birth cohort.[14,15] The proportion of men registered only with person identificational details in the DCD ranges from 4.5% to 9.0% of the cohort members across the period.

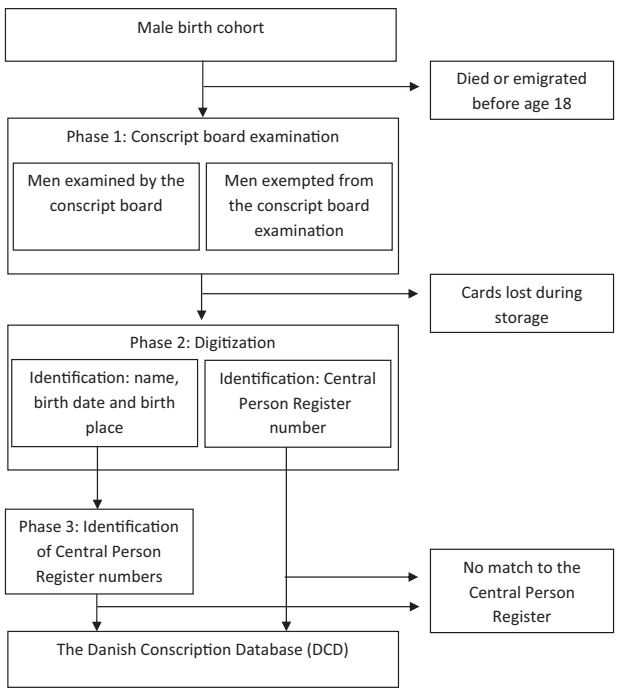


**Figure 1.** Flow chart illustrating the flow of men from birth and through the three phases of the establishment of the Danish Conscription Database (DCD).

## Phase 2: digitization

As the archive units were organized by year of conscription board examination, and we digitized full archive units, a few men from the adjoining birth cohorts were also included and not all men born in 1939 or 1959 were included in the DCD. This is illustrated in Figure 2, with higher proportions of missing men in the years 1939 and 1959 (53.4% and 45.7%, respectively), compared with the other birth years (proportions from 4.8% to 18.8%) when comparing the DCD population with the number of males born each year. Furthermore, register cards lost from one conscription district, due to a flooding, are reflected in the low proportions of men in the birth years from 1952 through 1954 in comparison with the adjoining birth years (Figure 2).

A selection of variables (see the 'What has been measured' section) from the conscription board register cards has been digitized by manually entering the information in the data entry program EpiData (EpiData, version 3.1, EpiData Association 2000-2014, Denmark). The digitization took place in the regional archives in Copenhagen, Odense and Viborg, and was carried out by student workers and archive personnel. Uniform guidelines were implemented at all three data collection sites. In cases with multiple examinations, it was decided to digitize information from the earliest examination that included an intelligence test score to, avoid retest-effects. The same principle was used to eliminate double entries from multiple cards on the same person. To ensure data quality, 1% of all cards were entered twice by two different people and subsequently compared. This procedure allowed us to discover problems with the data entry program and individual misunderstandings of the guidelines and to obtain a measure of data entry reliability. Based on the 1% sample of double entry, the error rates ranged from 0.5% to 1.4% depending on the variable. In total, 741 636 conscription board register cards were digitized.

## Phase 3: tracing Central Person Register (CPR)numbers

In Denmark, the personal identification numbers (CPR numbers) were introduced in 1968.[9] Before 1968 most men were registered on the conscription board register cards by their birth date and full name, and after 1968 essentially all men were registered by their CPR number.

Around 30% (224 844) of the digitized men were registered by name and birth date. The CPR numbers of these men were traced using a specifically developed matching program coded in Stata (Stata statistical software, version 12.1, StataCorp LP, College Station, TX). The program consists of 12 phases, where the criteria for a match are

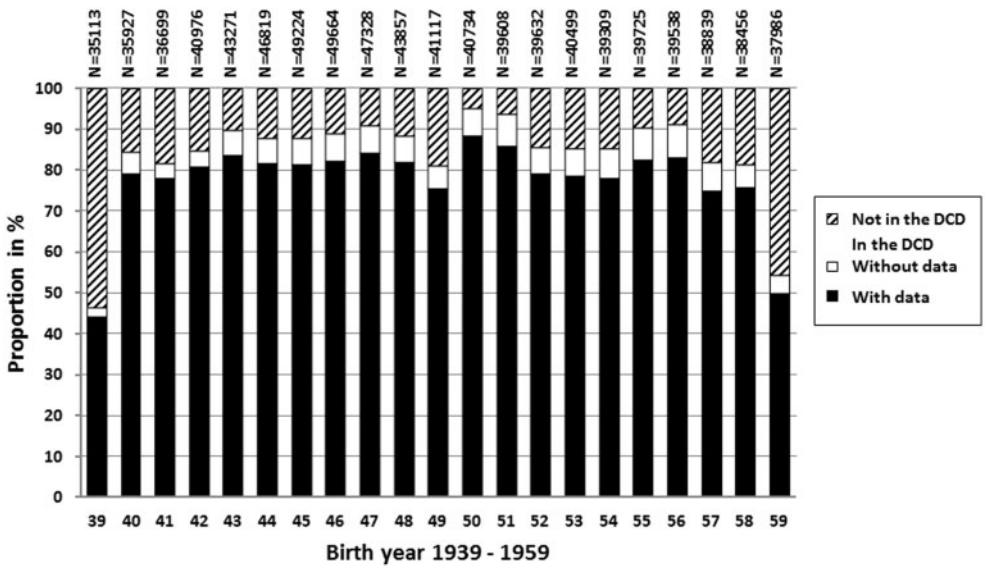


**Figure 2.** Proportion (%) of men in the Danish Conscription Database (DCD), presented according to status of missing examination data, in comparison with number of males born (*N*) in the period from 1939 through 1959.

loosened progressively. The program first compares the names of a conscript with the names of all male citizens registered on the same birthday in the CPR. Comparisons are based on the Levenshtein distance (or edit distance), where this distance between two character strings is defined as the minimum number of edits needed to transform one string into the other, with the allowable edit operations being insertion, deletion or substitution of a single character.[16] A Levenshtein distance between a DCD name and a CPR name of less than or equal to one was, in the initial phases, chosen as a threshold for individual names that could be considered matched. In some later phases, a distance of less than or equal to one for the comparison of the 6-digit birth date strings recorded in the DCD and CPR, respectively, were also searched for matches, and permutations of the order of day and month (DDMMYY vs MMDDYY) or of all individual first names and family names were also searched. In each phase, only unique—or in some cases uniquely best—matches were automatically accepted.

In total, 95.9% of the men registered by name and birth date were matched to the CPR and 88.0% were direct matches with a Levenshtein distance of zero. The matching program found one or more suggested matches not passing the criteria of uniqueness and matching quality for 6884 of the just around 9000 observations not matched to the CPR, and these will later be matched manually whenever possible.

Possible explanations for the failure to link 4.1% of the conscripts to the CPR include: (i) men who have died or emigrated in the period between the conscription board examination and the introduction of CPR numbers in 1968; and (ii) incorrect registration of either the birth date or the name of the conscript. Based on historical data from Statistics Denmark, it is estimated that about 1900 of the failed matches were caused by deaths in the cohort occurring before the introduction of the personal identification numbers in 1968.

Around 70% (516 792) of the 741 636 men digitized from the register cards were registered with a CPR number. Almost all (99.6%) of these men were directly matched to the CPR register. For the remaining 0.4% no match was found. Combining the observations matched, through CPR numbers directly and through names and birth dates, to CPR results in 730 396 observations. However, 2236 duplicate observations were removed and the DCD comprises 728 160 men which corresponds to 98.2% of the digitized conscription board register cards.

We compared the DCD population with a reference population from the CPR of Danish male citizens who were born from 1939 through 1959, were still alive in either 1968 or, for those born 1950 or later, at age 18, and who were not contained within the DCD. This analysis showed that, compared with the reference population, the mortality rates in the DCD-population were slightly lower for the birth cohorts born 1939–49 and slightly higher for the birth cohorts born 1950–59 (Table 1). The higher mortality rates among the men from the DCD with person identification details only (without data), compared with those with additional information from the conscription board examination (with data), is in accordance with the fact that most of these men have been exempt from appearing before the conscription board due to impaired health.

**Table 1.** Age-adjusted mortality rates (MR) per 100 000 person-years from 1 April 1968 to 31 December 2010 and 95 % confidence intervals (CI) by birth cohorts for a reference population, the full Danish Conscription Database (DCD) and the DCD population divided according to status of missing examination data

| Population | Birth cohort | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1939–59 | 1939–44 | | 1945–49 | | 1950–54 | | 1955–59 | |
| | N | MR | 95% CI | MR | 95% CI | MR | 95% CI | MR | 95% CI |
| Reference population[a] | 129 587 | 865 | 850–880 | 552 | 538–567 | 332 | 320–344 | 262 | 254–271 |
| DCD, all | 728 160 | 719 | 713–726 | 482 | 477–487 | 392 | 387–397 | 297 | 292–302 |
| DCD, ID and data | 675 321 | 712 | 706–718 | 473 | 468–478 | 371 | 366–376 | 277 | 272–281 |
| DCD, ID no data | 52 839 | 1160 | 1101–1222 | 882 | 838–928 | 799 | 768–832 | 670 | 639–703 |

[a]All Danish male citizens born from 1939 through 1959, who have not been identified in the DCD, were still alive in 1968 or, for those born 1950 or later, who were alive at age 18 years. ID = Identified with a person identification number.

## What has been measured?

The conscription board register cards hold a range of information on the profession, education, marital status, health, criminal records and suitability for military service of the conscript as well as information on when and where the conscript served. However, some of this information is likely to be of little importance in terms of impact on later health and other information would be recorded too early in life to accurately describe these men (e.g. marital status and profession of 18-year-olds). Consequently, a few variables were selected for digitization and will be described below. The completed and future linkages of the DCD to Danish health and socioeconomic registers will also be described and are presented in Table 2.

## Variables in the DCD

*Conscription board district*. Denmark is divided into seven conscription board districts, and the district in which the conscript was examined is registered in the DCD; 0.3% of observations were missing.

*Time of conscription board examination*. The year and half-year (January–June or July–December) of the conscript examination were recorded. This information was missing for 3.8% of observations.

*Height*. The height of the conscript was measured to the nearest centimetre at the conscription board examination. The height was measured without shoes during the physical examination undertaken by the conscription board physician. The height ranged from 100 to 225 cm with a mean of 176.8 cm [standard deviation (SD) = 6.6]; 7.5% of observations were missing.

*Weight*. The weight of the conscript was measured to the nearest kilogram during the physical examination. The conscripts are weighed in their underwear. The weight of the conscripts was not recorded by all conscription board districts in all years. In the central part of Jutland, the weight was only reported for about half of the conscripts who had been examined, and in the northern part of Jutland only 5% had their weight recorded. The weight ranged from 31 to 192 kg with a mean of 68.6 kg (SD = 9.3); 47.1% of observations were missing.

*Educational level at conscription*. The self-reported educational level of the conscripts was coded by the conscript board personnel. The coding of educational level changed in 1979 to accommodate changes in the Danish educational system. Before 1979, educational level was coded on a 1–9 point scale which incorporated both school education and post-school vocational training.[17] From 1979, the coding of educational level was based exclusively on school education. This coding was essentially a coding of years of school education with an 8–13 point range.[18] There were 8.0% missing observations.

*BPP (BørgePriensPrøve)*. The BPP is a group-administered paper and pencil intelligence test comprising four subtests (letter matrices,19 items; verbal analogies, 24 items; number series, 17 items; geometric figures, 18 items) to be completed within a fixed amount of time (45 min). The BPP test has been administered uniformly in the period from 1957 and up to today, with no item changes. The number of correct answers from all subtests was summed into the BPP score, with the range of 0–78. Scores from individual subtests are not recorded. However, high correlations have been found between each of the subtest scores and the full BPP score (r = 0.74–0.85). Furthermore, the full BPP score has been shown to correlate highly with the full-scale Wechsler Adult Intelligence Scale (WAIS) score (r = 0.82).[19] The mean BPP score was 37.8 (SD = 12.0); there were 8.0% missing observations.

**Table 2.** Current and future linkages of the Danish Conscription Database to Danish health and socioeconomic registers

| Register | Information | Start of electronic registration | The age (years) from which the information can be obtained for the youngest (born 1959) and oldest (born 1939) members of the cohort |
|---|---|---|---|
| *Current linkages* | | | |
| Danish Civil Registration System | Date of birth, vital status, marital status history | 1 April 1968 | Age: 9;29 |
| Danish Register of Causes of Death | Causes of death based upon death certificates Coded using ICD-8 for 1970-93 and ICD-10 for 1994-2010 | 1970 | Age: 11;31 |
| Danish Twin Registry | Zygosity vital status | 1870 | From birth |
| *Future linkages* | | | |
| *Health registers* | | | |
| Danish National Patient Register | Time of admission to somatic hospitals, surgical procedures and diagnoses at discharge. Discharge diagnoses coded using ICD-8 for 1977-93 and ICD-10 from 1994 onwards | 1977 | Age: 18;38 |
| Danish Psychiatric Central Research Register | Time of admission to psychiatric hospitals and diagnosis at discharge. Discharge diagnosis coded using ICD-8 for 1969-93 and ICD-10 from 1994 onwards | 1970 | Age 11;31 |
| Danish Cancer Registry | Time of cancer diagnosis coded using ICD-7 for 1966-94 and ICD-10 from 1994 onwards | 1940 | Age: birth;1 |
| Danish Diabetes Registry | Time of diabetes diagnosis coded using ICD-10, blood-glucose measurements and prescription of oral antidiabetics or insulin | 1995 | Age: 36, 56 |
| Danish National Prescription Register | Dispensed prescription drugs coded using Anatomical Therapeutical Chemical Classification System (ACT) codes | 1994 | Age: 35, 55 |
| *Socioeconomic registers* | | | |
| The Integrated Database for labour market research (IDA) in Statistics Denmark | Data from all companies with more than one employee, the taxation authorities, the registry relating to unemployment an the Integrated Student Registry. | 1981 | Age:21, 42 |
| DREAM database | Social benefits and other transfer payments | Mid 1991 | Age: 32, 52 |

### Data linkages

At present the data included in the DCD have been linked with the CPR, the Danish Register of Cause of Death and the Danish Twin Register (see Table 2). The 728 160 men have follow-up data on vital status and, if relevant, the underlying causes of death for the period of 1 April 1968 to 31 December 2010. More than 130 000 deaths have been identified in the DCD and information on one or more of the DCD variables is available for 91.0%. In addition, more than 9200 twins have been identified through a preliminary linkage of 500 000 of the DCD men to the Danish Twin Registry and information on the zygosity of the twins is available for 91.0%.

The DCD will be linked to the health and socioeconomic registers outlined in Table 2. Information on comorbidities as covariates and disease-specific outcomes will be obtained from health registers, and from the socioeconomic registers different measures of socioeconomic position (education, income and labour market affiliation) will be obtained. Moreover, the CPR numbers can be used to identify men in the DCD who belong to other Danish cohorts that hold information on a range of psychosocial, behavioural and biological factors. Agreements have been made with the Copenhagen School Health Records Register[20] and the relevant cohorts at the Research Centre for Prevention and Health.[21]

## What has it found? Key findings and publications

Danish conscription data on smaller populations or populations defined by specific diseases or geographical areas have previously been used to study the development of the prevalence of obesity,[15] the frequency of diabetes,[22] predictors of low intelligence[23,24] and the association between intelligence, social conditions and health.[25–27]

Data from the DCD show that in the birth cohorts from 1940 through 1959 there has overall been a steady increase in mean height from 174.6 cm to 179.1 cm, which corresponds to a rise of about 70% of a standard deviation

(Figure 3). Data for men born in 1939 were excluded due to low numbers of observations. The mean BPP score has also increased by almost 6 BPP score points (from 34.6 to 40.4), which is about half of a standard deviation. The secular increase in mean intelligence found in the DCD corresponds to earlier findings from Denmark based on samples of conscripts across birth cohorts from 1939–59 and 1969.[28] These findings of increasing intelligence test scores over the years are consistent with the Flynn effect of substantial and long-sustained increases in intelligence test scores, which has been documented in many parts of the world from roughly 1930 to the present day.[29] In this context it should be mentioned that more recent findings from Denmark also based on conscript data have shown a decline in mean intelligence test scores from 1998 to 2003/4.[17]

We also analysed the association of height and intelligence with mortality (Table 3). As expected, we found that both height and intelligence were inversely associated with mortality and this was consistent across birth cohorts.

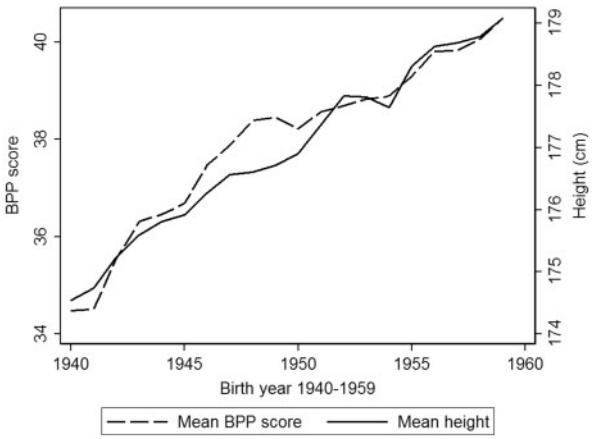


**Figure 3.** Mean height (cm) and mean intelligence test score (BørgePriensPrøve score, BPP-score) across birth years from 1940 through 1959.

## What are the main strengths and weaknesses?

### Strengths

A major strength of the DCD is the large size of the database and the potential for a long follow-up period through linkage to a wide range of Danish health and socioeconomic registers. Consequently, a high number of cases will be available for a number of different outcomes (e.g. specific diseases and causes of death) as well as information on different socioeconomic characteristics (e.g. income, social benefits or transfer payments). It will also be possible to identify men in the DCD who belong to other Danish cohorts that hold information on a range of demographic, psychosocial, behavioural and biological factors. Another strength of the DCD is the population-based nature of the cohort, which limits selection bias, because all men, with the exception of men who volunteer early or whose health is seriously impaired, are required by law to appear before the conscription board. This was confirmed by the analyses presented in Table 1. Furthermore, given that the intelligence test score of the conscripts is measured in young adulthood, the probability of the conscripts having experienced any bodily insults which could have affected their intelligence level is relatively low, which in turn limits the problem of reverse causality. Finally, it will be possible to combine the DCD with the Swedish and/or Norwegian cohorts.

### Weaknesses

The DCD is based on data that were originally collected with the purpose of assessing the suitability of the

**Table 3.** Age-adjusted mortality rates (MR) per 100 000 person years from 1 April 1968 or time of conscript board examination to 31 December 2010 and 95% confidence intervals (CI) by birth cohort and in relation to age, height and intelligence test score (BørgePriensPrøve score, BPP score)

| | | Birth cohorts | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1939–44 | | 1945–49 | | 1950–54 | | 1955–59 | |
| | | MR | 95% CI | MR | 95%CI | MR | 95% CI | MR | 95% CI |
| Height (cm), in tertiles[a] | Lowest | 784 | 773–795 | 527 | 519–535 | 425 | 416–433 | 323 | 315–332 |
| | Middle | 690 | 680–700 | 451 | 442–460 | 350 | 342–359 | 263 | 254–271 |
| | Highest | 657 | 646–668 | 426 | 418–435 | 324 | 316–333 | 235 | 227–243 |
| BPP score, in tertiles[a] | Lowest | 868 | 857–880 | 594 | 584–603 | 484 | 475–493 | 386 | 377–396 |
| | Midlle | 692 | 681–703 | 450 | 441–458 | 352 | 343–360 | 246 | 238–254 |
| | Highest | 552 | 542–562 | 362 | 354–370 | 265 | 257–272 | 182 | 175–189 |

[a]Birth cohort-specific tertiles.

individual conscripts for military service. This underlying premise of the data collection entails some weaknesses. First, the DCD only includes information on men, and the number of variables included in the DCD is limited. Second, up to 5–10% of all young men are exempted from appearing before the conscription board due to medical conditions. Hence the DCD does not contain information other than the identification details for these men. However, even though these men were not examined, the DCD still represents an almost full registration of all young Danish men. Third, although national guidelines were employed to ensure identical procedures across the different districts, the omission of especially the weight of the conscripts in some districts indicates that the guidelines have not always been followed in all districts. Fourth, there is a possibility that some men deliberately underperform on the intelligence test in the hope of appearing unqualified for military service or at least of becoming non-commissioned officers. However, the effect of motivation on the BPP score has been investigated and, in contrast to what was expected, Teasdale *et al*. found a modest negative relationship between the test score and a subsequent expressed positive attitude to being drafted. So contrary to what was expected, the men who expressed low motivation had the highest scores.[18] Furthermore, in 1978 a separate code was introduced for when a biased performance was suspected, so from 1978 onwards the BPP score is coded as missing in cases of suspicion of a biased performance. Fifth and finally, we were unable to match about 2% of the men in the DCD to the CPR. However, the failure to link these men to the CPR is assumed to be unsystematic.

## Can I get hold of the data? Where can I find out more?

The steering group of the DCD welcomes collaboration and the interest of national and international colleagues. For more information, please contact: danishconscriptiondatabase.glostrup-hospital@regionh.dk.

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**Conflict of interest:** None declared.

## References

1. Lynch J, Davey Smith G. A life course approach to chronic disease epidemiology. *Ann Rev Public Health* 2005;**26**:1–35.
2. Magnusson PKE, Rasmussen F, Lawlor DA, Tynelius P, Gunnell D. Association of body mass index with suicide mortality: a prospective cohort study of more than one million men. *Am J Epidemiol* 2006;**163**:1–8.
3. Sundet JM, Eriksen W, Borren I, Tambs K. The Flynn effect in sibships: Investigating the role of age differences between siblings. *Intelligence* 2010;**38**:38–44.
4. Zammit S, Rasmussen F, Farahmand B, Gunnell D, Lewis G, Tynelius P. Height and body mass index in young adulthood and risk of schizophrenia: a longitudinal study of 1 347 520 Swedish men. *Acta Psychiatr Scand* 2007;**116**:378–85.
5. Gravseth HM, Mehlum L, Bjerkedal T, Kristensen P. Suicide in young Norwegians in a life course perspective: population-based cohort study. *J Epidemiol Community Health* 2010;**64**:407–12.
6. Gjerstorff ML. The Danish Cancer Registry. *Scand J Public Health* 2011;**39**(**Suppl 7**):42–45.
7. Helweg-Larsen K. The Danish Register of Causes of Death. *Scand J Public Health* 2011;**39**(**Suppl 7**):26–29.
8. Lynge E, Sandegaard JL, Rebolj M. The Danish National Patient Register. *Scand J Public Health* 2011;**39**(**Suppl 7**):30–33.
9. Pedersen CB, Gøtzsche H, Møller JO, Mortensen PB. The Danish Civil Registration System. A cohort of eight million persons. *Dan Med Bull* 2006;**53**:441–49.
10. Strand BH, Kuh D, Shah I, Guralnik J, Hardy R. Childhood, adolescent and early adult body mass index in relation to adult mortality: results from the British 1946 birth cohort. *J Epidemiol Community Health* 2012;**66**:225–32.
11. Calvin CM, Deary IJ, Fenton C *et al*. Intelligence in youth and all-cause-mortality: systematic review with meta-analysis. *Int J Epidemiol* 2011;**40**:626–44.
12. Baker JL, Olsen LW, Sorensen TI. Childhood body-mass index and the risk of coronary heart disease in adulthood. *N Engl J Med* 2007;**357**:2329–37.
13. Gale CR, Batty GD, Tynelius P, Deary IJ, Rasmussen F. Intelligence in early adulthood and subsequent hospitalization for mental disorders. *Epidemiology* 2010;**21**:70–77.
14. Green A. The Danish Conscription Registry: a resource for epidemiological research. *Dan Med Bull* 1996;**43**:464–67.
15. Sonne-Holm S, Sørensen TIA. Post-war course of the prevalence of extreme overweight among Danish young men. *J Chronic Dis* 1977;**30**:351–58.
16. Levenshtein VI. Binary codes capable of correcting deletions, insertions, and reversals. *Soviet Physics-Doklady* 1966;**10**:707–10.
17. Teasdale TW, Owen D. The influence of paternal social class on intelligence and educational level. *Br J Educ Psychol* 1986;**56**:3–12.
18. Teasdale TW, Hartmann PVW, Pedersen CH, Bertelsen M. The reliability and validity of the Danish Draft Board Cognitive Ability Test: Børge Prien's Prøve. *Scand J Psychol* 2011;**52**:126–30.
19. Teasdale TW, Owen DR. Secular declines in cognitive test scores: A reversal of the Flynn Effect. *Intelligence* 2008;**36**:121–26.

20. Baker JL, Olsen LW, Andersen I, Pearson S, Hansen B, Sørensen TIA. Cohort profile: The Copenhagen School Health Records Register. *Int J Epidemiol* 2009;**38**:656–62.
21. Osler M, Linneberg A, Glümer C, Jørgensen T. The cohorts at the Research Centre for Prevention and Health, formerly 'The Glostrup Population Studies'. *Int J Epidemiol* 2011;**40**:602–10.
22. Green A, Andersen PK, Svendsen AJ, Mortensen K. Increasing incidence of early onset type 1 (insulin-dependent) diabetes mellitus: a study of Danish male birth cohorts. *Diabetologia* 1992;**35**:178–82.
23. Teasdale TW, Owen DR. Heredity and familial environment in intelligence and educational level – a sibling study. *Nature* 1984; **309:**620–22.
24. Sørensen HT, Rothman KJ, Gillman MW, Steffensen FH, Fischer P, Sabroe S. Historical cohort study of in utero exposure to uterotonic drugs and cognitive function in young adult life. *BMJ* 1999;**318:**433–34.
25. Osler M, Nordentoft M, Nybo Andersen A-M. Impaired childhood development and risk of suicide or attempted suicide in adult age. *J Epidemiol Community Health* 2008;**62**:23–28.
26. Batty GD, Mortensen EL, Nybo Andersen A-M, Osler M. Childhood intelligence in relation to adult coronary heart disease and stroke risk: evidence from the 1953 Danish male birth cohort study. *Paediatr Perinat Epidemiol* 2005;**19**:452–59.
27. Sonne-Holm S, Sørensen TIA. Prospective study of attainment of social class of severely obese subjects in relation to parental social class, intelligence and education. *BMJ* 1986;**292**: 586–89.
28. Teasdale TW. The Danish draft board's intelligence test, Børge Priens Prøve: psychometric properties and research applications through 50 years. *Scand J Psychol* 2009;**50:**633–38.
29. Neisser U (ed). *The Rising Curve: Long-Term Gains in IQ and Related Measures*. Washington, DC: American Psychological Association, 1998.