

**Title:** Cumulative Risks of Paternal and Maternal Incarceration in Denmark

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**What's Known on This Subject:** Many American children experience parental incarceration, which is a risk factor for poor child health and wellbeing in infancy, childhood, and adolescence.

**What This Study Adds:** Far fewer Danish than US children will ever have their mother or father incarcerated. High levels of incarceration in the US could lead US infants, children, and adolescents to be in worse health than their counterparts from other developed democracies.

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## **ABSTRACT**

**Background:** US children experience high cumulative risks of parental incarceration, but it is unclear just how high these risks are relative to those experienced by children in other countries.

**Method:** We use birth cohort life tables and Danish registry data to estimate the cumulative risks of paternal and maternal incarceration (including even very short jail stays of less than 24 hours) by age 14 for the 1990 Danish birth cohort. We then compare these estimates to estimates of the cumulative prevalence of paternal and maternal imprisonment for the 1990 US birth cohort.

**Results:** We estimate that 1.18% of Danish children will experience paternal imprisonment and that 4.60% of Danish children will experience any paternal incarceration (including jail stays less than 24 hours), indicating that US children are 73% more likely to have their fathers sent to prison (which usually results from a sentence of at least one year) than Danish children are to have their fathers spend less than one day in jail. Results for maternal imprisonment are similar.

**Conclusions:** US children are far more likely to be exposed to parental incarceration than are Danish children. Because parental incarceration is a risk factor for poor health and wellbeing among children, this disparity in exposure to this risk factor could lead to disproportionately poor health among US children relative to children growing up in other developed democracies.

## INTRODUCTION

Dramatic increases in US imprisonment have rendered imprisonment common not only for US adults,<sup>1-5</sup> but also for their children.<sup>6</sup> As parental imprisonment has become common for US children, researchers have started to test the association between parental incarceration and the health and wellbeing of infants, children, and adolescents. Research in this area has shown not only that paternal incarceration is a risk factor for poor health and wellbeing among US infants,<sup>7</sup> children,<sup>8-13</sup> and adolescents,<sup>14-18</sup> but also that maternal incarceration is a risk factor for poor child health and wellbeing across the life-course.<sup>15, 19-22</sup> Similar associations exist in a host of developed democracies, including England,<sup>23, 24</sup> Norway,<sup>25</sup> the Netherlands,<sup>26</sup> and Denmark.<sup>27</sup>

Unfortunately, because no research has estimated the cumulative risk of paternal or maternal incarceration in any country other than the US, it remains unclear how much more likely US children are to be exposed to parental incarceration than are children living in other countries. In this article, we fill this gap in research by estimating the cumulative risk of paternal and maternal incarceration for Danish children using the same methods (birth cohort life tables), birth cohort (1990), and age range (birth to age 14) as research providing companion estimates for the US<sup>6</sup> did. We do this in order to be certain that differences in the cumulative risk of paternal and maternal incarceration in Denmark and the US are not driven by the method, birth cohort, or age range used in this article. Unlike US-based research, which can provide estimates only for paternal and maternal prison incarceration (for reasons discussed in previous research),<sup>6</sup> we provide estimates for the following six lengths of paternal and maternal incarceration: those lasting (1) more than six months, (2) more than three months, (3) more than one month, (4) more than two weeks, and (5) more than 24 hours, as well as (6) any jail entry (including those lasting less than 24 hours). We also show US-based estimates<sup>6</sup> in order to facilitate comparisons.

## **METHOD**

### **Data**

All analyses rely on administrative records from Statistics Denmark and include the entire population of the country and have basically no attrition. We use data from Denmark for two reasons. First, as mentioned above, the data are extremely high-quality and facilitate generating precise estimates. Second, because Denmark has one of the lowest rates of incarceration in the developed world,<sup>28</sup> having estimates of the cumulative risk of parental incarceration from Denmark and the US means that researchers working in this area will now have a sense of just how large the range in the cumulative risks of parental incarceration is across countries.

The data include complete information on all criminal justice contacts resulting in even a very brief incarceration (including those lasting less than 24 hours) for all Danes since 1980. Thus, although the data used to estimate the cumulative risk of parental imprisonment for US children only make it possible to measure prison incarcerations,<sup>6</sup> the Danish registry data make it possible for us to consider not just long prison stays but also short jail stays. Because Danish sentences tend to be much shorter than American ones—on average about three months, with early release available after half the sentence is served for sentences longer than three months, and only 15% of sentences exceeding one year<sup>29</sup>—we consider first parental incarcerations that last more than (1) six months, (2) three months, (3) one month, (4) two weeks, and (5) 24 hours, as well as (6) any jail entry (including less than 24 hours). We label six months incarcerated—the least amount of time a US adult sentenced to prison could expect to serve with early release for good behavior—as prison incarceration for the Danish results. Results using sentence length instead would yield similar conclusions, although they would exaggerate Danish-US disparities.

The data were acquired through a longstanding agreement with Statistics Denmark, and the Cornell University IRB determined that this research was not human subjects research.

### **Analytic Strategy**

We use birth cohort life tables to estimate the cumulative risks of paternal and maternal imprisonment and shorter incarceration durations by age 14 for the 1990 Danish birth cohort using the methods outlined in previous research using US data<sup>6</sup> and Danish registry data. Tables 1 and 2 show the number of children in the 1990 Danish birth cohort who survived to each age, as well as the number of children who experienced different lengths of paternal and maternal incarceration for the first time at each age. In the interest of preserving confidentiality, Statistics Denmark will not allow us to publish numbers less than five, which explains why the number of children experiencing maternal incarceration is marked as <5 for some of the cells in Table 2.

[Insert Tables 1 and 2 about here.]

Before moving on to the results, it is also worth noting that the US-based research we use as our point of comparison estimated the cumulative risk of parental imprisonment for Blacks (Hispanic and non-Hispanic) and Whites (Hispanic and non-Hispanic) but not the population.<sup>6</sup> Our US estimate is therefore based on applying the race-specific cumulative risks presented in previous research to the proportion of US children in those groups in that birth cohort.<sup>6</sup>

## **RESULTS**

### **The Cumulative Risk of Paternal Incarceration for Danish Children**

Table 3 presents estimates of the cumulative risk of paternal and maternal incarceration for Danish and US children. For American children, results are presented only for prison

incarceration. But for Danish children, estimates are presented for the cumulative risk of ever experiencing parental incarceration lasting more than (1) six months, (2) three months, (3) one month, (4) two weeks, and (5) 24 hours, as well as (6) any jail entry (including less than a day).

The estimates indicate that 7.96% of US children born in 1990 could expect to ever have their father imprisoned by their 14<sup>th</sup> birthday. As our estimates show, the cumulative risk of paternal imprisonment is far smaller for Danish children (at 1.18%). Indeed, according to our estimates, Danish children are 85% less likely to experience paternal imprisonment than are American children. They are also far less likely to have ever had their father incarcerated for more than three months (1.38%), more than one month (1.96%), more than two weeks (2.64%), and more than 24 hours (3.70%). Interestingly, Danish children are also less likely to have had their father incarcerated for even less than 24 hours (at 4.59%) than are American children to have ever had their father imprisoned, indicating a sentence of at least a year (at 7.96%).

The crossnational disparities in the cumulative risk of paternal incarceration between Denmark and the US are thus stark, with Danish children 42% less likely to have had their father incarcerated even for less than 24 hours than US children are to have had their father sent to prison. To conceptualize just how large this gap is, consider that Danish children are slightly more likely to have had their father incarcerated even just for 24 hours by age 14 (4.60%) than American children are to have ever had their father imprisoned by age 6 (4.46%).

[Insert Table 3 about here.]

### **The Cumulative Risk of Maternal Incarceration for Danish Children**

Differences in the cumulative risk of maternal incarceration were also pronounced, although very few children experience maternal incarceration in the US or Denmark. The estimates suggest that

only 0.58% of US children born in 1990 could expect to have their mother imprisoned at any point between their birth and their 14<sup>th</sup> birthday. For Danish children from the same birth cohort, the parallel risk is 0.15%, which is 74% lower than the risk for US children. Danish children were also less likely to have their mother incarcerated for more than three months (0.17%), more than one month (0.22%), more than two weeks (0.29%), and more than 24 hours (0.43%) than US children were to have their mother sent to prison (0.58%). Yet Danish children were slightly more likely to have ever had their mother experience even a jail stay of less than one day (0.71%) than US children were to have had their mother sent to prison, a finding that runs somewhat against the tide of the rest of the results presented here for paternal incarceration.

## **DISCUSSION**

Although scholars of child health and wellbeing have been considering the association between parental incarceration and child health and wellbeing for well over 10 years, no research has compared the cumulative risk of parental incarceration for US children to that of other children living in a country with a much lower incarceration rate. The goal of this article was to fill that research gap by estimating the cumulative risk of paternal and maternal incarceration for Danish and US children by age 14. By providing these estimates, we show how extreme the US risks of parental imprisonment are in comparative perspective and, in so doing, greatly expand research in this area by showing how mass imprisonment may have exacerbated not only racial disparities in child health and wellbeing in the US,<sup>11, 12</sup> but also disparities between the US and other developed democracies in child health and wellbeing, with implications for the standing of the US relative to the rest of the world in terms of the health and wellbeing of our children.

Results for the cumulative risk of paternal and maternal incarceration for Danish and US children further reinforce just how common an experience parental incarceration is for American children relative to children living in other developed democracies. As the cumulative risks of maternal incarceration are still low in both countries, suggesting that elevated cumulative risks of maternal incarceration in the US are unlikely to play a substantial role in contributing to differences across countries in child health and wellbeing, we focus our discussion on the paternal incarceration results. Roughly 1 in 12 US children can expect to have their father experience imprisonment at some point between their birth and their 14<sup>th</sup> birthday; roughly 1 in 85 Danish children experience this event over the same period. In fact, Danish children are even less likely to have their father locked up for any period of time—including for less than 24 hours—than US children are to have their father sent to prison (1 in 22 to 1 in 12), showing just how pervasive an experience the incarceration of a father is for US children.

Although these results provide a unique demonstration of how the comparatively novel US experiment in mass imprisonment affects US children, they are not without their limitations. Maybe most importantly, the results presented here consider only one country other than the US, making the comparison somewhat incomplete. Future research should thus seek to provide estimates of the cumulative risk of incarceration for men and women in other countries and paternal and maternal incarceration for the children that are left behind, paying special attention to developed democracies with somewhat higher incarceration rates (albeit still much lower than the US), such as the United Kingdom, Australia, and Spain, to name three such countries. In a similar vein, the analyses herein do not show how much of the difference in the cumulative risk of paternal and maternal incarceration is due to differences in the incarceration rate and how much of it is due to differences in the age-patterning of fertility in the US and Denmark. Future



research must also formally decompose these differences into components due to differences in the criminal justice system and components due to differences in the timing of fertility.

## CONCLUSION

By showing how common parental incarceration is in the US relative to Denmark, a country with a far lower incarceration rate, the results show how high rates of incarceration in the US could contribute to a divergence between the US and other developed democracies in child health and wellbeing because parental incarceration is both much more common in the US and so damaging to child health and wellbeing. Future analyses of the connections between parental incarceration and child health should therefore be alert to the fact that high rates of incarceration in the US may contribute not only to growth in racial disparities in child health and wellbeing in the US, but also to growing inequality between the US and other developed democracies.

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Table 1. 1990 Danish birth cohort at risk of paternal criminal justice contact by age length of contact

Age	Population	Prison	> 3 months	> 1 month	> 14 days	> 24 hours	All entries
1	63428	49	60	76	107	164	248
2	62982	77	88	137	172	285	379
3	62666	76	89	139	211	323	417
4	62424	79	86	139	195	275	328
5	62194	71	88	125	181	246	276
6	61959	51	60	99	151	222	265
7	61781	52	61	79	112	161	193
8	61619	53	58	88	114	167	181
9	61500	51	62	74	105	135	159
10	61350	48	50	66	89	103	127
11	61222	25	31	49	64	81	118
12	61112	37	51	57	50	61	86
13	61020	25	34	45	50	62	79
14	60935	41	45	58	63	60	76

Table 2. 1990 Danish birth cohort at risk of maternal criminal justice contact by age and length of contact

Age	Population	Prison	> 3 months	> 1 month	> 14 days	> 24 hours	All entries
1	63428	< 5	< 5	< 5	8	12	23
2	62982	9	10	11	15	23	46
3	62666	9	9	10	13	20	41
4	62424	10	13	17	18	32	46
5	62194	5	8	9	13	20	36
6	61959	14	13	17	19	31	40
7	61781	5	6	8	10	22	33
8	61619	9	8	12	17	22	25
9	61500	< 5	5	6	12	21	28
10	61350	< 5	< 5	< 5	7	10	23
11	61222	10	10	13	13	16	34
12	61112	< 5	< 5	< 5	9	13	20
13	61020	8	8	10	14	14	27
14	60935	6	7	9	10	10	21

Table 3. Cumulative risks of parental criminal justice contact in the US and Denmark, 1990 birth cohort

Age	US *	Denmark **					All entries
	Prison	Prison	> 3 months	> 1 month	> 2 weeks	> 24 hours	
<b>Paternal</b>							
1	0.95	0.08	0.09	0.12	0.17	0.26	0.39
2	1.80	0.20	0.23	0.34	0.44	0.71	0.99
3	2.57	0.32	0.38	0.56	0.78	1.22	1.64
4	3.27	0.45	0.51	0.78	1.08	1.65	2.16
5	3.90	0.56	0.65	0.98	1.37	2.04	2.59
6	4.46	0.64	0.75	1.14	1.61	2.39	3.01
7	4.95	0.73	0.85	1.26	1.79	2.65	3.31
8	5.43	0.81	0.94	1.40	1.97	2.91	3.59
9	5.88	0.89	1.04	1.52	2.14	3.12	3.84
10	6.33	0.97	1.12	1.63	2.28	3.28	4.04
11	6.77	1.01	1.17	1.71	2.38	3.41	4.23
12	7.18	1.07	1.26	1.80	2.46	3.51	4.36
13	7.58	1.11	1.31	1.87	2.54	3.61	4.49
14	7.96	1.18	1.38	1.96	2.64	3.70	4.60
<b>Maternal</b>							
1	0.03	0.00	0.01	0.01	0.01	0.02	0.04
2	0.06	0.02	0.02	0.02	0.04	0.06	0.11
3	0.09	0.03	0.04	0.04	0.06	0.09	0.17
4	0.13	0.05	0.06	0.07	0.09	0.14	0.25
5	0.16	0.06	0.07	0.08	0.11	0.17	0.31
6	0.20	0.08	0.09	0.11	0.14	0.22	0.37
7	0.24	0.09	0.10	0.12	0.15	0.26	0.42
8	0.28	0.10	0.11	0.14	0.18	0.29	0.46
9	0.32	0.11	0.12	0.15	0.20	0.33	0.51
10	0.37	0.11	0.12	0.16	0.21	0.34	0.55
11	0.42	0.13	0.14	0.18	0.23	0.37	0.60
12	0.47	0.13	0.15	0.19	0.25	0.39	0.63
13	0.52	0.15	0.16	0.20	0.27	0.41	0.68
14	0.58	0.15	0.17	0.22	0.29	0.43	0.71

\* US estimates based on Wildeman (2009) and incorporating the racial distribution of the 1990 birth cohort

\*\* Danish numbers are our calculations using data from Statistics Denmark