

Risk of Diabetes Mellitus in Persons with and without HIV: A Danish Nationwide Population-Based Cohort Study

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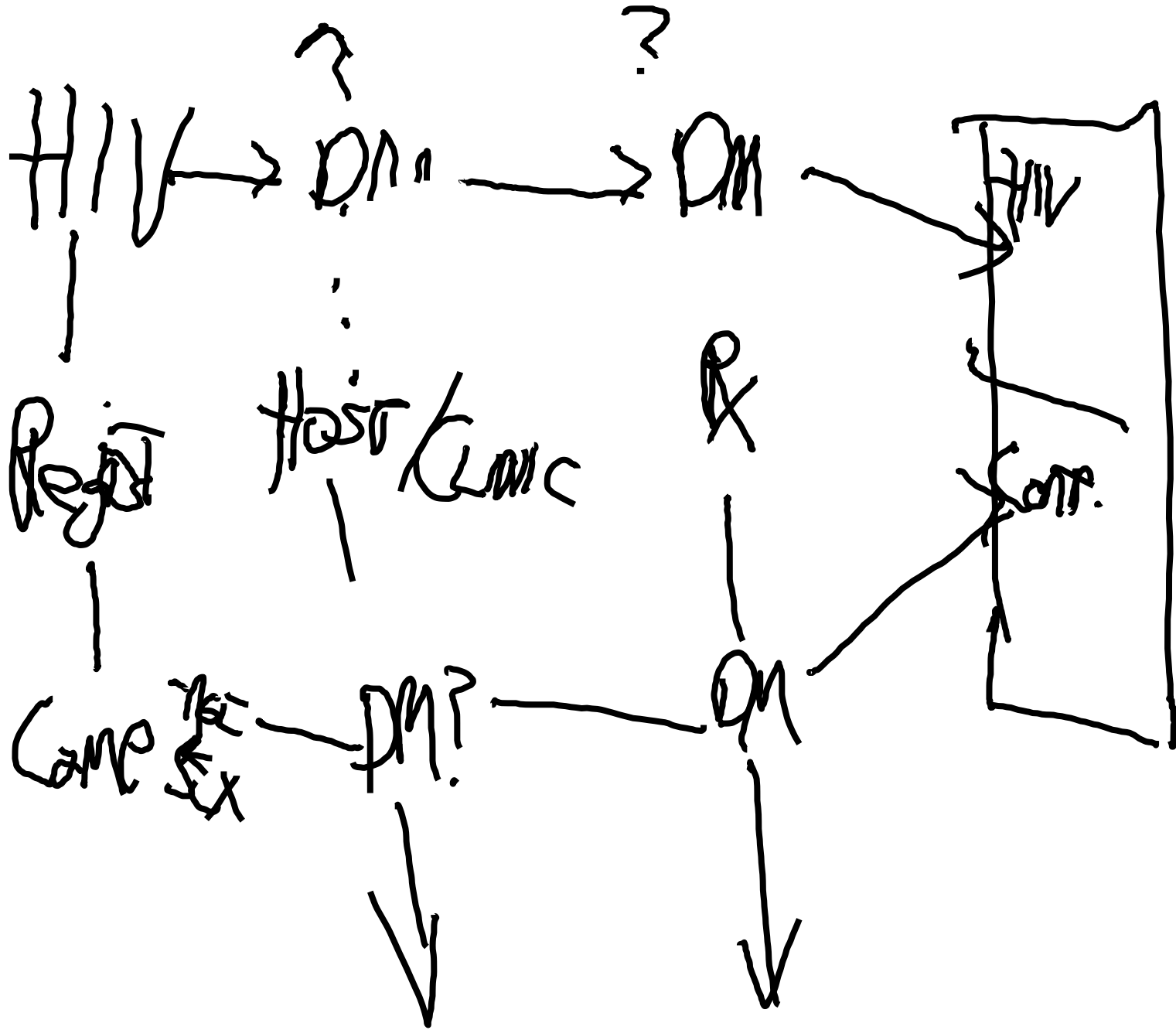
Abstract

Objective: In a nationwide, population-based cohort study we assessed the risk of diabetes mellitus (DM) in HIV-infected individuals compared with the general population, and evaluated the impact of risk factors for DM in HIV-infected individuals.

Methods: We identified 4,984 Danish-born HIV-infected individuals from the Danish HIV Cohort Study and a Danish born population-based age- and gender-matched comparison cohort of 19,936 individuals (study period: 1996–2009). Data on DM was obtained from the Danish National Hospital Registry and the Danish National Prescription Registry. Incidence rate ratios (IRR) and impact of risk factors including exposure to Highly Active Antiretroviral Therapy (HAART) and antiretroviral drugs were estimated by Poisson regression analyses.

Results: In the period 1996–1999 risk of DM was higher in HIV-infected individuals compared to the comparison cohort (adjusted IRR: 2.83; 95%CI: 1.57–5.09), both before (adjusted IRR: 2.40; 95%CI: 1.03–5.62) and after HAART initiation (adjusted IRR: 3.24; 95% CI: 1.42–7.39). In the period 1999–2010 the risk of DM in HIV-infected individuals did not differ from that of the comparison cohort (adjusted IRR: 0.90; 95% CI: 0.72–1.13), although the risk was decreased before HAART-initiation (adjusted IRR: 0.45; 95%CI: 0.21–0.96). Increasing age, BMI and the presence of lipoatrophy increased the risk of DM, as did exposure to indinavir, saquinavir, stavudine and didanosine.

Conclusion: Native HIV-infected individuals do not have an increased risk of developing DM compared to a native background population after year 1998. Some antiretroviral drugs, not used in modern antiretroviral treatment, seem to increase the risk of DM.



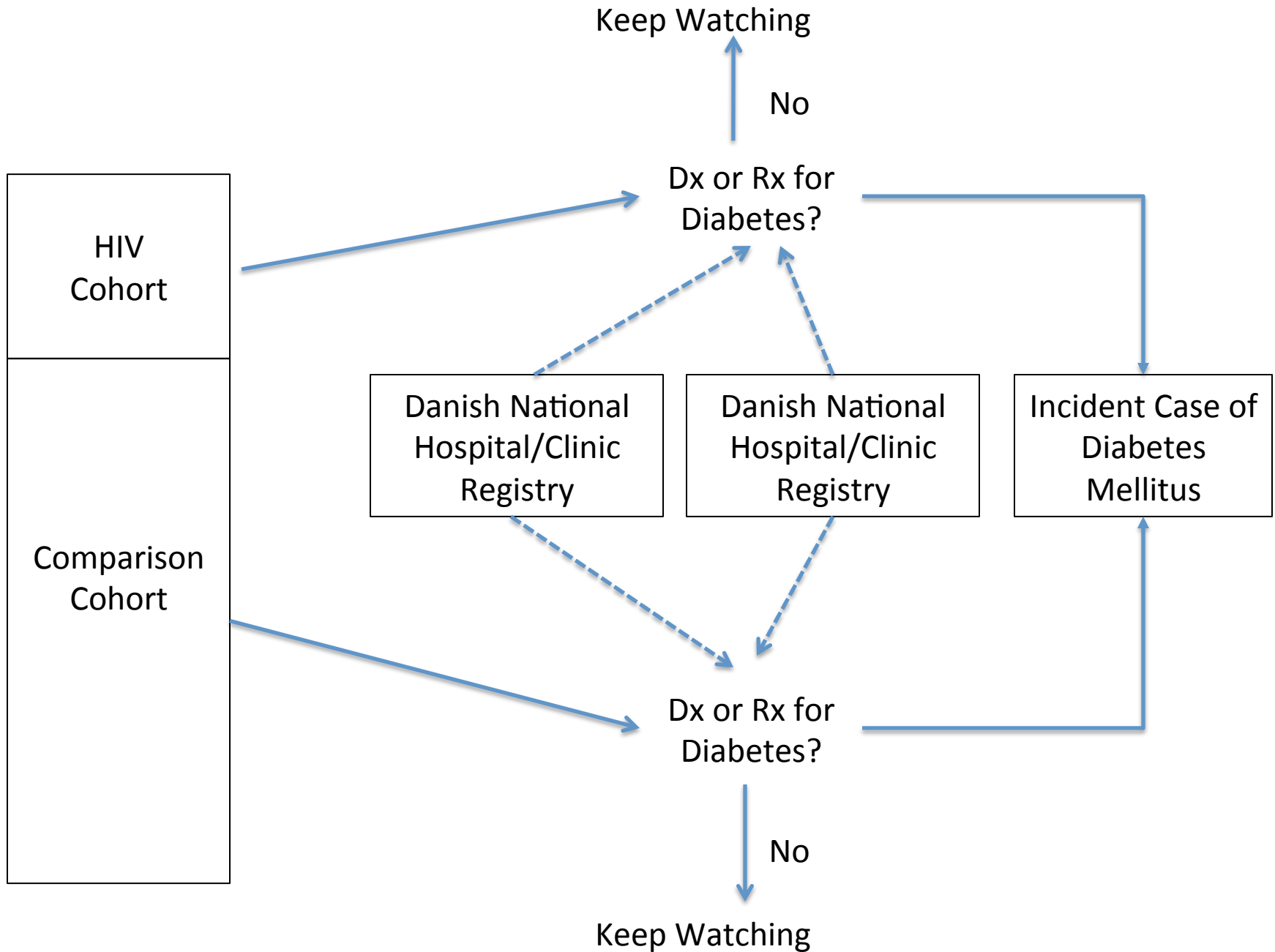
HIV
C

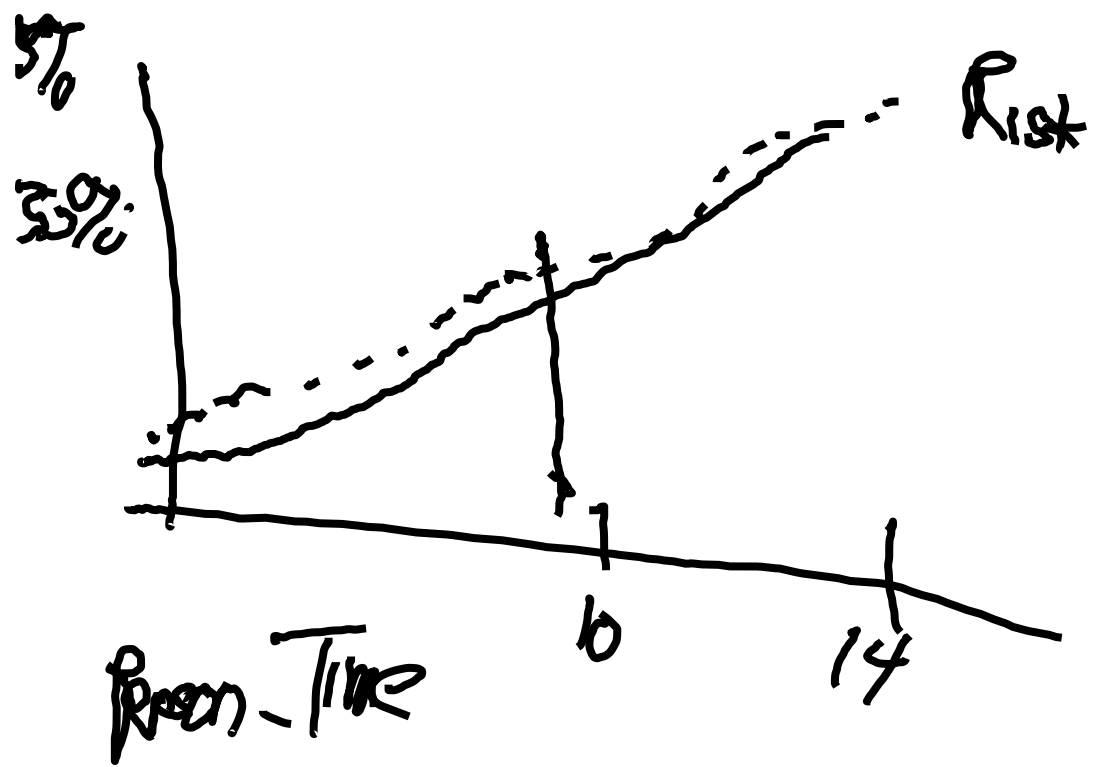
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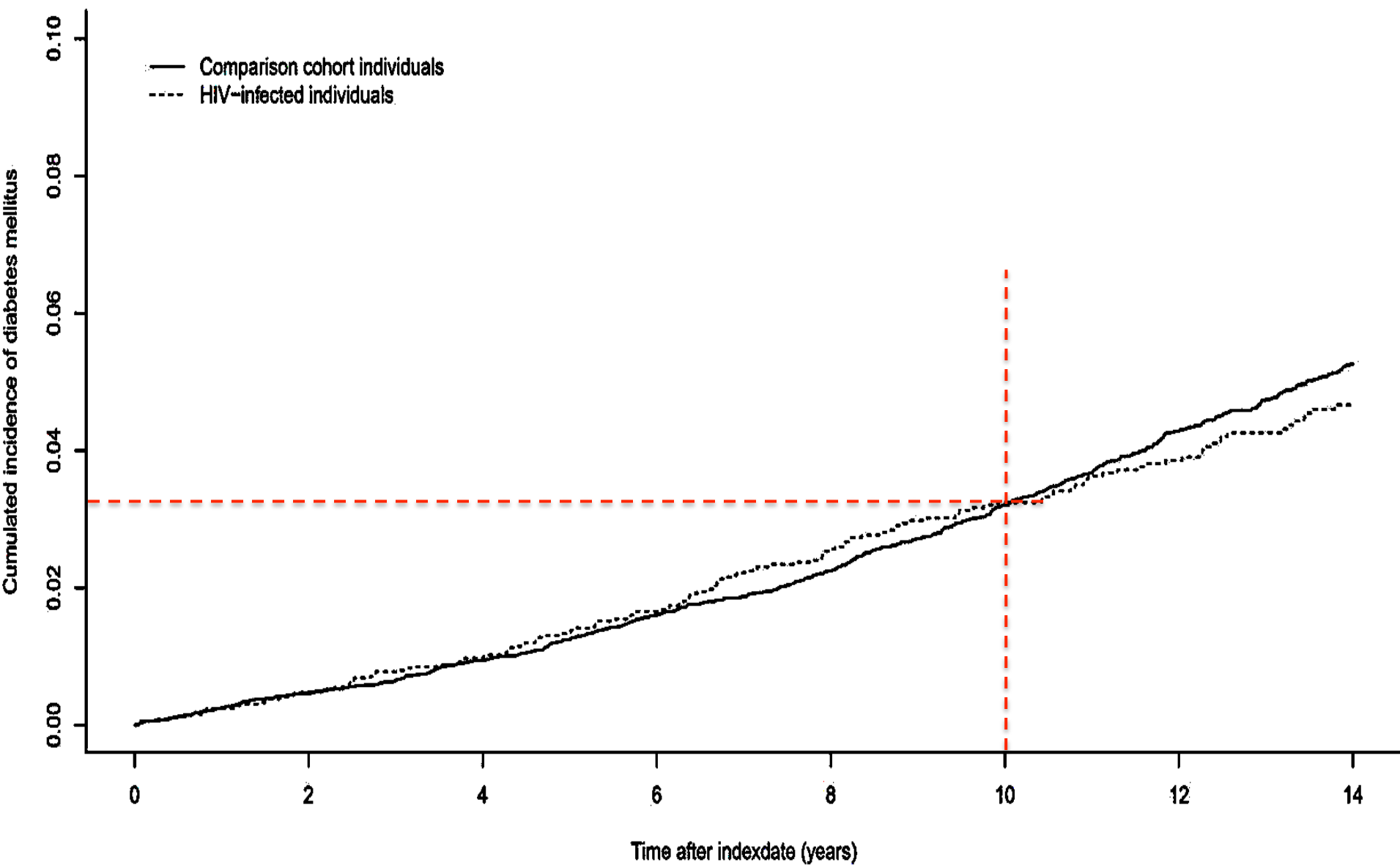
New
DB

Hosp/
CLINIC

New DM







At 10 years of follow-up from first HIV diagnosis, or from the corresponding index date in the comparison cohort, the cumulative incidence of new DM onsets was about 0.035 or 3.5%

$$\frac{105}{28,105} = 35 / 1000$$

$$3/13 = 2/1000$$

$$21/89 = 25/1000$$

Table 2. Risk of diabetes mellitus (DM) in Danish k individuals.

| | DM events/PYR HIV-infected individuals |
|---------------------------|---|
| Diabetes mellitus: | 105/28,342 |

105 events / 28,342 person years = 3.7 per 1,000 pyr

Table 3. Impact of body mass index (BMI), age and lipoatrophy on

| | DM events (105) | PYR (28,342) |
|---------------------------------------|-----------------|--------------|
| Baseline variables: | | |
| Body mass index (BMI): | | |
| Underweight (BMI: <18.5) | 3 | 1,513 |
| Normal weight (BMI: 18.5–24.9) | 36 | 15,466 |
| Overweight (BMI: 25.0–29.9) | 22 | 5,239 |
| Obesity (BMI: >30.0) | 21 | 899 |

Underweight $3 / 1,513 = 2.0$ per 1,000 pyr
Obese $21 / 899 = 23.4$ per 1,000 pyr