

ESM Methods

Study design, setting and population

In Israel, all Jewish residents and some minorities are obligated to serve in the Israeli Defense Forces (IDF). As part of the draft process, they go through a medical evaluation at the age of approximately 17 years, which includes a medical interview, a review of medical history provided by the primary care physician, and a physical examination performed by a physician [1]. In addition, socio-demographic data are obtained, including country of birth, year of birth, year of immigration and country of origin if born in Israel.

Figure 1 shows schematically our construction of the study sample. Data was gathered from the IDF database by an army officer, not part of the study's authors, authorized by the military to do so. The study population includes all Jewish adolescents, aged 16-19 years, examined at the recruitment centers between 1967, the year when complete computerized records were initiated, and 2014. We excluded 39,057 (1.4%) examinees with missing date of immigration or birth country. We excluded from the study 47,525 adolescents from the underrepresented minority populations, as most of them are exempt from military service and are not routinely examined. Finally, included in this study were 2,721,767 examinees (1,619,793 men) among whom 4,733 were diagnosed with diabetes. The sample of Jewish men is considered nationally representative [1], but less so for Jewish women, as Orthodox women are exempt from military service and are usually not examined.

Study variables

Age at assessment and year of birth were treated as continuous or categorical variables (Table 1). Date of birth and date of immigration were obtained from the Israeli Ministry of Internal Affairs database and the age at immigration was computed accordingly. Age at immigration was categorized into 0-5 years (pre-elementary school), 6-11 years (elementary school) and 12-19 years (post elementary school).

Origin for immigrants was defined by country of birth. Origin for Israeli-born was defined by paternal or paternal grandfather's country of birth if the father was born in Israel, as described previously [1]. As similarly performed [2, 3], origin was divided into the following categories: states of the former Soviet Union (Former USSR), Middle East and North Africa (ME/NA) (Arab countries), Western countries (including western and central Europe, the Americas, Australia, New Zealand and South Africa) which represent Ashkenazy Jews, Ethiopia, and Israeli-natives which represent all fourth-generation immigrants and onwards.

Residential socio-economic status (SES) data was obtained from the Israeli Minister of Internal Affairs, ranked on a 1-10 scale created by the Israeli Central Bureau of Statistics and categorized into low (1-4), medium (5-8), and high (8-10), as previously performed [1].

Diabetes cases were based on a physician diagnosis of diabetes according to the American Diabetes Association (ADA) criteria by documenting one of the followings: (1) Two fasting plasma glucose tests equal or higher than 7.00 mmol/l, (2) a random blood glucose test equal or higher than 11.1 mmol/l two hours after ingesting a solution

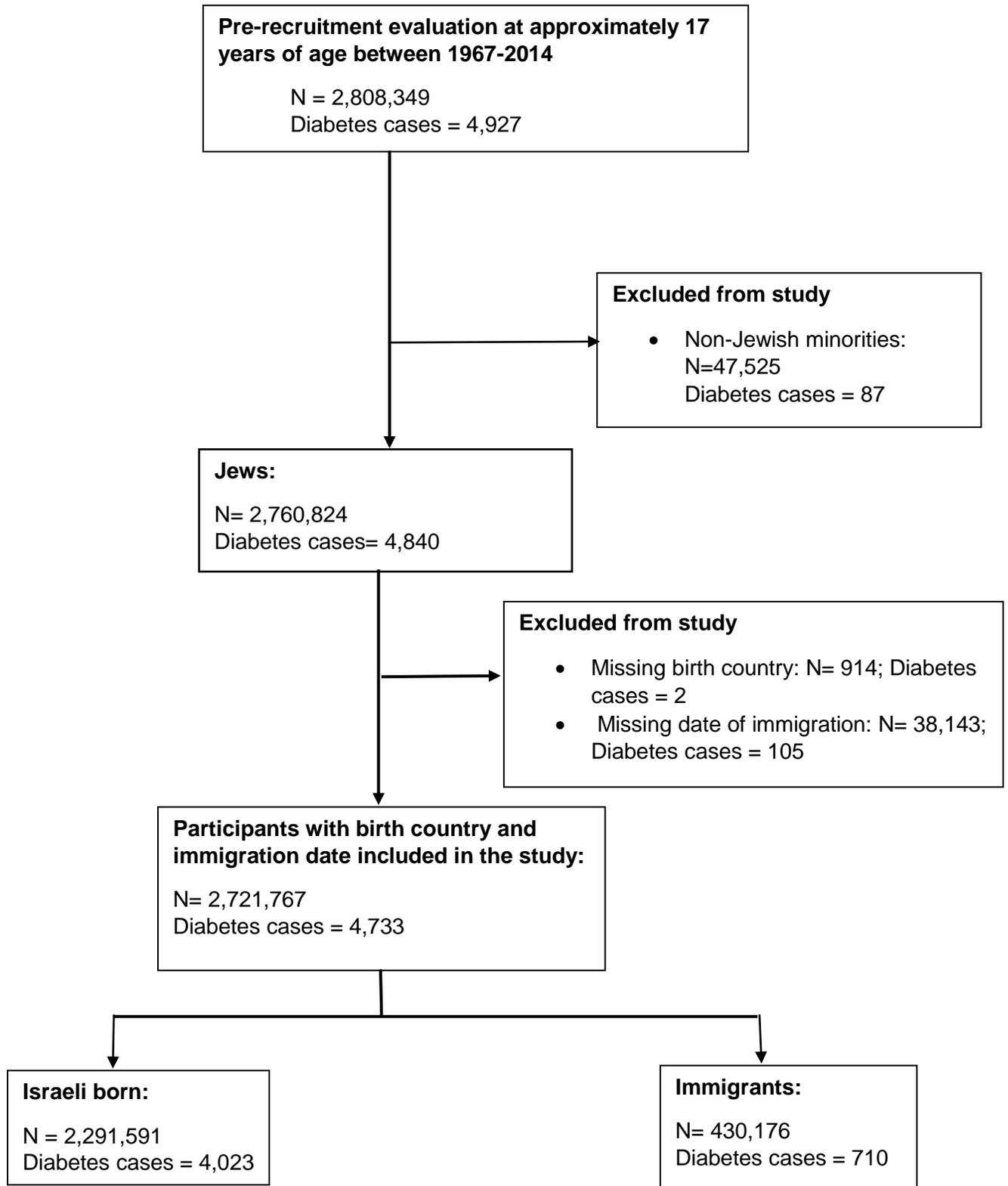
containing the equivalent of 75 grams of glucose, or (3) a random plasma glucose level equal or higher than 11.1 mmol/l in a patient with classic symptoms of hyperglycemia [4]. In 1997 the ADA changed the fasting plasma glucose criteria by lowering the threshold from ≥ 7.8 mmol/l to the current ≥ 7.00 mmol/l. To address this issue, we stratified the cohort by the year of enrolment (earlier and later than 1997) and analyzed age at immigration both as categorical and continuous variable. See electronic supplementary material (ESM) table S1, S2. Additional stratification of the study population by year of enrolment (1967-1979, 1980-1999, 2000-2014) was made to address the different time periods included in our study, and the environmental changes they encompass. See ESM table S1, S2.

Statistical Methods

Distribution of all study variables per age at immigration groups was performed for the total population and presented in a chart with numbers and percentages. Associations between age at immigration and diabetes were assessed in several steps. First, a univariate logistic regression model was performed with the Israel-born participants as the reference group. Next, a partially adjusted multivariable logistic regression model was applied with adjustment for birth year, age at assessment and sex (ESM table S1), and a fully adjusted model also with country of origin and residential SES. The fully adjusted model was also applied for age at immigration as a continuous variable. Finally, the study population was stratified by origin and the fully adjusted model was applied to each immigrant group with the Israel-born participants of the same origin as the reference, and with an additional Israeli-native group (at least fourth generation immigrants) for comparison.

Odd ratios (ORs) are presented with 95% confidence interval (CI). All tests were 2-tailed, and statistical significance was defined as $p < 0.05$. Statistical analyses were performed with SPSS version 23.0 (IBM Corp., Armonk, N.Y., USA).

ESM Figure 1: Study flow chart



ESM Results

ESM Table 1: Various analyses with age at immigration as a categorical variable

		Age at Immigration			
		Israeli-born	0-5	6-11	12-19
Total population - partially adjusted model	OR	1	1.12	0.94	0.77
	95% CI	-	1.00, 1.26	0.82, 1.08	0.67, 0.90
	P value	-	0.060	0.403	<0.001
Men - fully adjusted model	OR	1	0.93	0.80	0.60
	95% CI	-	0.78, 1.12	0.65, 0.98	0.48, 0.75
	P value	-	0.440	0.034	<0.0001
Women - fully adjusted model	OR	1	1.08	0.87	0.73
	95% CI	-	0.88, 1.32	0.67, 1.11	0.55, 0.97
	P value	-	0.487	0.254	0.032
Study population enrolled between 1967-1979 - fully adjusted model	OR	1	0.71	0.41	0.30
	95% CI	-	0.34, 1.46	0.15, 1.10	0.11, 0.81
	P value	-	0.349	0.077	0.018
Study population enrolled between 1980-1999 - fully adjusted model	OR	1	1.28	0.98	0.73
	95% CI	-	0.97, 1.69	0.75, 1.30	0.56, 0.95
	P value	-	0.082	0.904	0.019
Study population enrolled between 2000-2014 - fully adjusted model	OR	1	1.00	0.77	0.56
	95% CI	-	0.85, 1.18	0.63, 0.95	0.44, 0.73
	P value	-	0.970	0.013	<0.001
Study population enrolled until 1996 - fully adjusted model	OR	1	0.93	0.80	.58
	95% CI	-	0.69, 1.26	0.55, 1.17	0.43, 0.78
	P value	-	0.644	.248	<0.001
Study population enrolled from 1998 onwards - fully adjusted model	OR	1	1.01	0.80	0.61
	95% CI	-	0.86, 1.18	0.66, 0.96	0.49, 0.76
	P value	-	0.936	0.015	<0.0001

Analyses include: partially-adjusted model (adjusted for birth year, age at assessment and sex), fully-adjusted models with stratification of the study population by sex, year of enrolment (1967-1979, 1980-1999, 2000-2014) to address the different time periods included in the study, and additional stratification by year of enrolment (earlier and later than 1997) to address the change in the ADA fasting plasma glucose criteria that occurred in 1997.

ESM Table 2. Various analyses with age at immigration as a continuous variable.

	Age at Immigration	
Men - fully adjusted model	OR	0.976
	95% CI	0.956, 0.997
	P value	0.025
Women - fully adjusted model	OR	0.969
	95% CI	0.944, 0.994
	P value	0.015
Immigrants enrolled between 1967-1979 - fully adjusted model	OR	0.965
	95% CI	0.875, 1.064
	P value	0.475
Immigrants enrolled between 1980-1999 - fully adjusted model	OR	0.997
	95% CI	0.989, 1.007
	P value	0.580
Immigrants enrolled between 2000-2014 - fully adjusted model	OR	0.999
	95% CI	0.996, 1.002
	P value	0.376
Immigrants enrolled until 1996 - fully adjusted model	OR	0.966
	95% CI	0.934, 1.000
	P value	0.047
Immigrants enrolled from 1998 onwards - fully adjusted model	OR	0.963
	95% CI	0.943, 0.983
	P value	0.0003

Analyses include fully-adjusted models with stratification for immigrant men and women, fully-adjusted models with stratification for immigrants by year of enrolment (1967-1979, 1980-1999, 2000-2014) and additional stratification for immigrants by year of enrolment (earlier and later than 1997) to address the change in the ADA fasting plasma glucose criteria that occurred in 1997.

References

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[4] American Diabetes Association (2011) Standards of medical care in diabetes--2011. *Diabetes Care* 34 Suppl 1:S11-61