High Birthweights among Infants of North African Immigrants in Belgium

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ABSTRACT

Objectives. This study examined birthweights of North African immigrants in Belgium.

Methods. Analyses focused on Belgian single live birth certificates from 1981 to 1988.

Results. Low-birthweight (< 2500 g) rates were 3.1% among 34 686 newborns of North African origin and 4.8% among 804 286 newborns of Belgian origin. The entire North African birthweight distribution was shifted toward higher birthweights than the Belgian distribution. Low frequencies of low birthweights among North Africans were still observed after marital status, occupation of the father, and parity had been taken into account.

Conclusions. Despite their low socioeconomic status, North African immigrants have high birthweights. (*Am J Public Health.* 1998;88: 808–811)

Introduction

The paradox of good health outcomes among Mexican Americans is well documented[1]: despite their generally lower socioeconomic status, Mexican Americans exhibit rates of infant mortality and low birthweight that are equivalent to those of non-Hispanic Whites. Recent Mexican immigrants have been shown to have even fewer low-birthweight newborns than other Mexican Americans.[2,3] Most other foreign-born populations also have good birth outcomes in the United States.[4] In this paper, we examine whether this paradox is also observed among immigrants in Europe.

In several countries of continental Europe, the most numerous groups of non-European immigrants are from North Africa.[5–7] Among these countries, Belgium is the only one that has birthweight registered on birth certificates.[8,9] Analysis of Belgian data thus offers a unique opportunity to study neonatal outcomes of North African immigrants. Analyses performed thus far have included limited numbers of births and grouped North Africans with other immigrants.[10–12]

In this study, we sought to analyze all available years of vital records to compare birthweights of newborns of North African and Belgian origin. Neonatal mortality was also examined.

Methods

Belgian single-live-birth and death certificates from 1981 to 1988 were analyzed; 1981 was the first year that birthweight data were available, and 1988 was the most recent database provided by the Belgian National Institute for Statistics. Birth and death certificates were not linked. However, birthweight information is included on both birth certificates and infant death certificates, which allows calculation of birthweight-specific neonatal mortality rates.

Newborns were classified according to the nationality of their mothers before marriage. North Africa was defined as including Algeria, Morocco, and Tunisia. Other available variables were marital status, occupation of the father, and parity. The definition used in the birth certificates restricted parity to births occurring during the current marriage.

We first compared all newborns of Belgian and North African origin. Next, we restricted the analyses to births to married women whose husbands were manual workers, because the vast majority of North African mothers fall in this category.[10] We also stratified by parity.

The Wilcox-Russell approach was used to separate the birthweight distributions into main and residual distributions.[13] This procedure identifies a Gaussian distribution, as well as a residual portion of births falling outside the lower tail of the distribution. The very small infants in the residual distribution are almost all preterm.

Also, we computed the rates of low-birthweight (<2500 g) infants. In our stratified analysis, we computed relative risks of low birthweight for each strata, Mantel–Haenszel weighted relative risks, and 95% confidence intervals.

We computed neonatal mortality rates, including birthweight-specific rates. Neonatal deaths were defined as occurring between 0 and 27 completed days of life.

Results

There were 804 286 live births among Belgians and 34 686 among North Africans. The entire North African birthweight distribution was shifted toward higher birthweights than the Belgian distribution (Figure 1). As calculated via the Wilcox and Russell method, the mean main (Gaussian)

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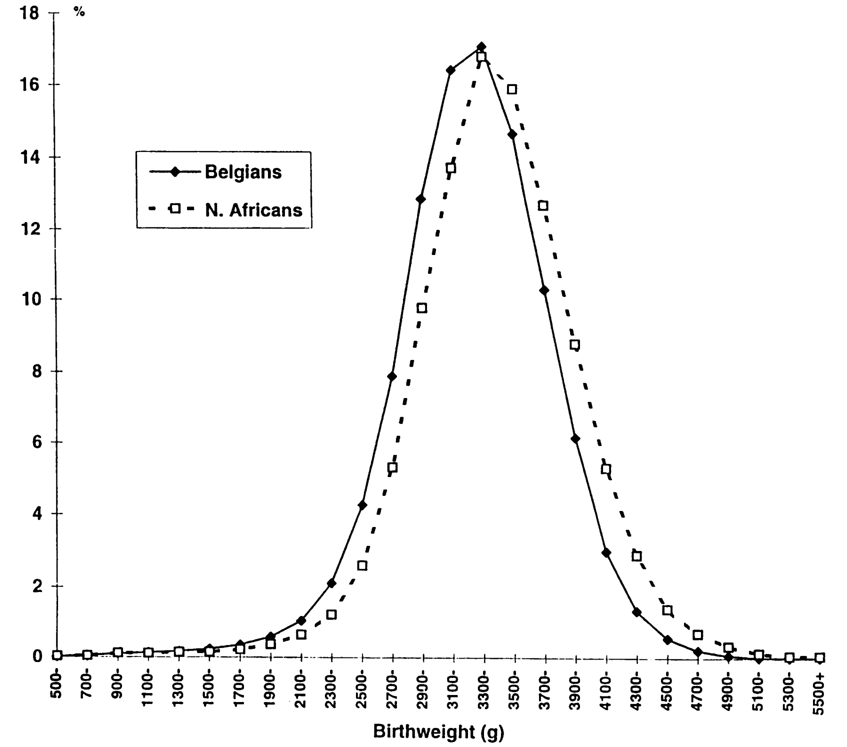

Note. Data were derived from 1981–1988 Belgian single live birth certificates.

FIGURE 1—Birthweights of North African and Belgian newborns.

TABLE 1—Birthweight-Specific Neonatal Mortality Rates among North African and Belgian Newborns

Birthweight, g	Nationality of Mother	Live Births, No.	Neonatal Deaths per 1000
<500	North African	0	
	Belgian	18	777.8
500–1499	North African	153	379.1
	Belgian	3 840	331.0
1500–2499	North African	910	60.4
	Belgian	34 955	34.5
2500–3499	North African	16 726	4.6
	Belgian	470 975	2.9
3500–4499	North African	15 810	3.4
	Belgian	285 090	1.5
>4499	North African	943	5.3
	Belgian	7 250	2.6
Not stated	North African	144	76.4
	Belgian	2 158	42.6
Total	North African	34 686	7.5
	Belgian	804 286	5.4

Note. Data were derived from 1981–1988 Belgian single live birth certificates.

birthweight distribution was higher among North Africans (3503 g) than among Belgians (3355 g). The standard deviations of the main birthweight distribution were 489 g and 461 g, respectively, and the residual distribution was smaller among North Africans (1.2%) than among Belgians (1.7%). Low-birthweight (< 2500 g) rates were 3.1% among North Africans and 4.8% among Belgians.

There were 260 (7.5 per thousand) neonatal deaths among North Africans and 4379 (5.4 per thousand) among Belgians. Table 1 shows that neonatal mortality rates were high among North Africans across all birthweight categories.

North African mothers were more frequently married (97.7%) than Belgian mothers (92.8%). Fathers were manual workers in 78.8% of the cases among North Africans and 42.2% of the cases among Belgians.

In analyses including only mothers married to manual workers, the low-birthweight rates were 2.9% among 26 478 North Africans and 5.4% among 311 859 Belgians (Table 2). Table 2 also shows that North Africans had fewer low-birthweight newborns than Belgians across all parities. Relative risks decreased from 0.81 among primiparas to 0.31 among women at parity 5 and higher. There were 226 (8.5 per thousand) neonatal deaths among North Africans married to manual workers and 1855 (5.9 per thousand) among Belgians married to manual workers. The numbers of neonatal deaths among North African and Belgian primiparas married to manual workers were 44 (9.5 per thousand) and 998 (6.3 per thousand), respectively.

Discussion

Surprisingly, there were few low-birthweight newborns among North Africans, despite their low socioeconomic status. Other Belgian studies have also shown lower birthweights among Belgians than among immigrants.[10–12] Furthermore, in the Netherlands, immigrants of Mediterranean origin have been shown to have high birthweights as well.[14,15]

High birthweights have been observed in North Africa.[16] Moroccans have been cited as one of the few ethnic groups with no association between poverty and birthweight.[17] Data from Ceuta, a Spanish territory on the Moroccan coast, indicate that newborns of Moroccan origin have higher birthweights than newborns of Spanish origin.[18] These observations from North Africa suggest that the high birthweights observed among North Africans in Belgium are not entirely the result of a selection of healthy migrants.

In Israel, infants of North African origin also have been shown to have higher birthweights than infants of other ethnic groups.[19] However, birthweight is higher when the mother immigrated from North Africa to Israel after the age of 10 years than when she immigrated at a younger age or was born in Israel. This suggests that environmental factors play a role in the observed differences in birthweight distributions.

TABLE 2—Low Birthweight (< 2500 g) among North African and Belgian Newborns, by Parity: Mothers Married to Manual Workers

Parity	Nationality of Mother	Live Births, No.	Birthweight < 2500 g, %	Relative Risk (95% Confidence Interval)
1	North African	4 611	4.9	0.81 (0.71, 0.92)
	Belgian	158 489	6.1	
2	North African	4 468	3.0	0.68 (0.58, 0.81)
	Belgian	102 175	4.3	
3	North African	4 335	3.0	0.60 (0.51, 0.72)
	Belgian	35 206	5.0	
4	North African	3 737	2.4	0.40 (0.32, 0.49)
	Belgian	10 446	6.1	
5+	North African	9 327	2.0	0.31 (0.26, 0.37)
	Belgian	5 543	6.3	
Total	North African	26 478	2.9	0.58 (0.54, 0.62)[a]
	Belgian	311 859	5.4	

Note. Data were derived from 1981–1988 Belgian single live birth certificates.
[a] Mantel–Haenszel weighted relative risk.

Differences in nutrition, smoking, or social support networks are possible mechanisms that could explain the reduced frequency of low-birthweight newborns and the high birthweight of North African immigrants. A diet with a high carbohydrate content has been reported as a possible cause of high birthweight in Tunisia.[16]

In our study, differences in the frequency of low birthweight between Belgians and North Africans were especially large at high parities (Table 2). However, desired family sizes are probably larger for North Africans than for Belgians. Thus, many North African women at low risk will be represented among the high parity groups, while the high parity Belgian women are more likely to be at high risk.[20]

Differences in preterm rates could also be involved. Many North African women do not know the date of their last menstrual period.[21] It is thus difficult to compare the frequency of preterm deliveries among different populations in Belgium. However, the residual birthweight distribution was smaller among North Africans than among Belgians. Any difference in 2 residual distributions would suggest a corresponding difference in the proportion of small preterm births (< 2500 g and < 37 weeks) in the 2 populations.[22] Thus, North Africans probably experience fewer preterm births than Belgians.

Neonatal mortality was high among North Africans. The relationship between this excess of mortality and the accessibility and quality of care is unknown. North Africans experience inadequate prenatal care more often than Belgians.[23] Other differences in access and quality of care may exist and should be investigated in future studies.

A widely accepted paradigm is that populations of low socioeconomic status are more likely to have low-birthweight newborns. Our data on North African immigrants in Belgium, along with data on immigrants in the United States, are challenging traditional views of low-birthweight epidemiology. □

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Effects of Radon Mitigation vs Smoking Cessation in Reducing Radon-Related Risk of Lung Cancer

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ABSTRACT

Objectives. The purpose of this paper is to provide smokers with information on the relative benefits of mitigating radon and quitting smoking in reducing radon-related lung cancer risk.

Methods. The standard radon risk model, linked with models characterizing residential radon exposure and patterns of moving to new homes, was used to estimate the risk reduction produced by remediating high-radon homes, quitting smoking, or both.

Results. Quitting smoking reduces lung cancer risk from radon more than does reduction of radon exposure itself.

Conclusions. Smokers should understand that, in addition to producing other health benefits, quitting smoking dominates strategies to deal with the problem posed by radon. (*Am J Public Health.* 1998; 88:811–812)

Introduction

The Environmental Protection Agency (EPA) considers radon a major cause of lung cancer that is responsible for 7000 to 30 000 deaths in the United States annually.[1] The agency has urged Americans to test their homes and remediate those in which radon readings exceed 4 pCi/L.[2]

EPA distinguishes the risks of radon exposure for smokers and never smokers in its *A Citizen's Guide to Radon.*[3] The risks are dramatically higher for smokers, reflecting an interaction effect between radon and cigarette smoking.[3–5] Although the guide recommends quitting smoking, along with remediating homes with high radon readings, no publication has compared the risk reduction attainable by radon mitigation, smoking cessation, or the two combined.

Methods

In our analysis, we used the standard radon lung cancer risk model used by EPA, BEIR IV,[4] linked with 2 other models, one describing the distribution of radon in homes in the United States[6,7] and one characterizing Americans' patterns of moving to new homes[8] (averaging 10 or 11 moves throughout their lives[9]). Introducing realistic patterns of residential mobility greatly reduces estimates of the individual risk confronted by people currently residing in high-radon homes, simply because they will spend most of their lives in lower-radon homes.[5,8] The models and the analytical process have been described elsewhere[5,8] (a technical appendix is available from the authors).

In using the BEIR IV model, we assumed a multiplicative relationship between smoking and radon exposure to estimate the effects on risk reduction of radon mitigation alone, smoking cessation alone, or both together. We assumed that mitigation means reducing all elevated radon exposures to 2 pCi/L, the level that EPA believes can be attained on average.[1] If individuals were to remediate one home and then move to another high-radon home, we assumed that they would remediate that home as well.

To compute the risk reduction attributable to quitting smoking, we assumed that background lung cancer risk declines linearly from levels for current smokers to the average for former smokers in 15 years. This was an extremely conservative approach that, for 2 reasons, considerably underestimates risk reduction: (1) it treats the average risk for former smokers as the risk attained 15 years following cessation, although the average former smoker has been abstinent only a few years, and (2) empirical evidence on lung cancer risk reduction after cessation of smoking indicates a rate of decline more rapid than linear.[10]

As with EPA's results, our findings represent averages for both sexes. In actuality, risks will be higher for men, and risk reductions greater, because men have higher background lung cancer rates.[11]

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