


## SHORT COMMUNICATION

# Hepatitis B screening among immigrants: How to successfully reach the Moroccan community

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## 1 | INTRODUCTION

Most countries have included hepatitis B in their universal childhood vaccination programme. Therefore, the challenge to reduce the hepatitis B disease burden has shifted towards finding chronically infected individuals, and treating them if indicated to prevent long-term consequences, such as cirrhosis, hepatocellular carcinoma, and premature death.

In Western Europe, the overall prevalence of hepatitis B carrier-ship is too low to warrant screening of the general population, but immigrants born in Asian and African countries have a higher prevalence, and might, therefore, be targeted for screening.<sup>1</sup>

In the Netherlands, screening with the hepatitis B surface antigen (HBsAg) was calculated to be cost-effective for (sub)populations with an endemicity of 0.41% or higher.<sup>2</sup> Moroccan-Dutch citizens constitute the second largest immigrant population in the Netherlands, and the

HBsAg prevalence in first-generation Moroccan-Dutch is 0.54%.<sup>3</sup> The Dutch Health Council advised HBsAg screening for immigrants born in endemic countries (i.e. first-generation immigrants), but this is not yet implemented. Anticipating the HBsAg screening of Moroccan-Dutch, we researched the intention to participate, and found it to be 44%.<sup>4</sup> This was expected as participation rates in other screening programmes are lower in comparison to indigenous Dutch, due to a lack of awareness and knowledge.<sup>5</sup> Sampling this population for research is equally challenging. We piloted the use of respondent-driven sampling (RDS) in researching awareness and information needs on HBsAg screening among this population. RDS starts with a convenience sample of the study population, so-called seeds.<sup>6</sup> Seeds (wave zero) are asked to complete a questionnaire, and recruit peers from their social network (wave one) for the same questionnaire, and so on. This process is repeated until the desired sample size or 'equilibrium' (i.e. when the sample characteristics are assumed to be independent from the seeds' characteristics) is reached,

**Abbreviations:** CI, confidence interval; FGI, first-generation immigrants; GP, general practitioner; HBsAg, hepatitis B surface antigen; RDS, respondent-driven sampling; RIVM, National Institute for Public Health and the Environment; SGI, second-generation immigrants.

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or if peer recruitment dies out. Unique tokens are used to follow who recruited whom, and draw recruitment trees. Population estimates are made with a statistical model that weighs the sample to compensate for the non-random recruitment. In earlier published RDS studies on various topics (e.g. sexual behaviour and diabetes) among immigrant populations in Europe, the reported RDS performance (i.e. reach and recruitment success) varied widely. In this short communication, we describe the successful performance of RDS to reach Moroccan-Dutch, and estimate information needs on HBsAg screening. Our findings may help to reach and screen other minority populations in Western European countries.

## 2 | METHODS

We conducted an offline cross-sectional study from February to November 2019, using RDS, to distribute paper-based questionnaires among Moroccan-Dutch aged 16 years and above. We included those born in Morocco (first-generation immigrants, FGI), and those born in the Netherlands and having at least one parent born in Morocco (second-generation immigrants, SGI). We recruited seeds at community venues, such as mosques and day care centres in municipalities with relatively large numbers of Moroccan-Dutch (three large and two middle-large cities).

After questionnaire completion, respondents were asked to invite four peers (later two peers). Respondents could choose between receiving (new) questionnaires in person at the community venue, by making an appointment with one of the researchers, or to receive them by mail. We used incentives for completing the questionnaire (5 EUR voucher), and for recruiting each new respondent (2.50 EUR voucher per respondent, later 5 EUR).

Since Moroccan-Berber languages and Moroccan-Arabic dialects are solely speaking languages, we developed the questionnaire in 'simple' Dutch. To check for clarity and understandability, we piloted the questionnaire among a small sample of Moroccan-Dutch. It contained 37 questions, including sociodemographic characteristics, awareness and knowledge on hepatitis B and HBsAg screening, intention to participate in HBsAg screening or what to advise others, and information needs. Two Moroccan-Berber-speaking female researchers assisted during face-to-face questionnaire administration.

Tree visualizations and analyses were performed in R (version 3.6.0; igraph package version 1.2.5) and RDSAnalyst (version 2.2.1.0). Ethical approval was waived by the ethics committee of the University Medical Centre Utrecht, nr: 18-679/C. For compliance with the General Data Protection Regulation, we asked respondents to give their written informed consent for personal data processing before participation.

## 3 | RESULTS

### 3.1 | Respondent-driven sampling performance

Of 21 seeds, 10 successfully recruited peers (Figure 1) for a total sample of 295. Of this sample, 171 were FGI (58.0%) and 124 SGI

(42.0%); 37.7% [95% CI 29.2–46.2] were male, which was lower than the national percentage of 51.0% in 2019 (Table S1-S2). Fifty per cent were recruited before wave 4 (Figure S1). Two thirds (63.7%) reported willingness to recruit others, of whom the majority preferred to receive questionnaires in person (81.9%) rather than via mail. The majority (84.7%) needed assistance to successfully complete and/or forward the questionnaire to others. Researchers assisted in 52.9% of the recruitments by handing over the questionnaire via the recruiters' referral, directly contacting the peer(s) by phone, explaining the study's objectives and methodology, and for some, translating the questionnaire. Respondents were more likely to recruit peers of the same age, educational level, degree, and number of years living in the Netherlands (among FGI).

Equilibrium was reached for all characteristics, except for the average level of hepatitis B knowledge and its screening, and educational level (Figures S2-S12).

### 3.2 | Awareness, knowledge, and information needs

Few FGI (18.6% [95% CI 6.5–30.7]) had ever heard of HBsAg screening (of SGI 28.1% [95% CI 11.8–44.4]), and 39.0% [95% CI 24.8–53.3] had a need for information (of SGI 39.8% [95% CI 23.6–56.0]; Table S3). There is a lack of knowledge on the asymptomatic nature of chronic hepatitis B, the possible long-term consequences of the disease, and the main transmission route of the virus in this population (i.e. mother-to-child).

Of all respondents, 74.9% did not know that one can have hepatitis B without having symptoms, and 68.1% were unaware of the cancer risk (Table S4). Respondents wanted most frequently more information about the risk for and possible long-term consequences of chronic hepatitis B (Table S5).

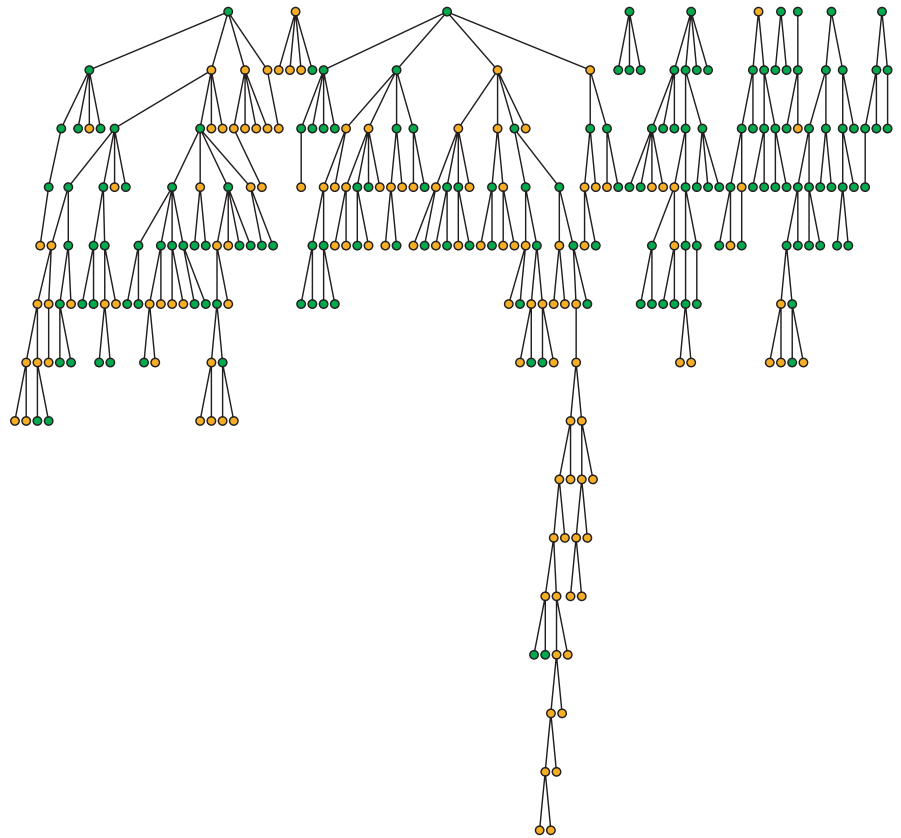
Respondents preferred to receive information via personal contact (29.1%), or via written information (23.1%) from the general practitioner (GP) or nurse (49.5%; Table S6). According to 75.3%, this information should be available in Dutch. However, most FGI preferred a dual approach in both Moroccan-Arabic and Dutch.

Three quarters (73.6%) reported a positive intention to participate in screening and the majority (67.5%) would also advise their (grand) parent(s) to participate (Table S7). Among those targeted for screening (i.e. FGI), the most frequently reported reason to not participate in screening was 'not having symptoms'.

## 4 | DISCUSSION

This pilot demonstrated the feasibility of using RDS to sample hard-to-reach Moroccan populations in urban Netherlands. We reached 14 waves, 295 Moroccan immigrants, and equilibrium for most characteristics. This suggests that RDS might be a useful approach for targeted campaigns directed at identifying chronic carriers of the hepatitis B virus among immigrants.

**FIGURE 1** Recruitment trees by country of birth. Green: first-generation immigrants (FGI), Orange: second-generation immigrants (SGI)



Of all respondents, 77% had heard of hepatitis B and 23% of HBsAg screening. Less than half has sufficient knowledge and information needs. SGI have heard of hepatitis B far more often than FGI. We found a lack of knowledge on the asymptomatic nature of chronic hepatitis B, which is likely to influence screening intention, as 'not having symptoms' was the main reason for not intending to participate in HBsAg screening.

In a previous study, only 17% of the Moroccan-Dutch were found to have sufficient hepatitis B knowledge, compared to 48% in the current study.<sup>4</sup> Since the sample composition was similar, this difference is most likely based on the variety of questions that were used to capture any existing knowledge on the disease. The 48% is in line with research among Turkish-Dutch, of whom 42% had sufficient knowledge on hepatitis B.<sup>7</sup> Future information materials should be ideally conveyed personally by the GP in Dutch and Moroccan-Arabic. An emphasis on the asymptomatic course of the disease could potentially increase future HBsAg screening participation rates among Moroccan FGI.

Respondents provided peer recruitments with 53% of the respondents requesting researchers' assistance. Providing assistance is not uncommon in RDS studies, as it helps to overcome barriers, speed up recruitment, and thus facilitate continuation of recruitment chains. As Moroccan-Dutch represent a hard-to-reach population, especially those with a low educational level and limited Dutch language proficiency, we consider active assistance justified to find the right answers on how to reach this population. Because of the required time and efforts, RDS should be mainly considered as an additional strategy for such hard-to-reach subgroups (e.g. low-literate).

Participation of female, younger, and higher educated Moroccan-Dutch was higher than average. This sampling bias and the fact that our sample is relatively small and geographically clustered, and did not reach equilibrium for all characteristics, imply that our population estimates should be considered with caution.

As young men have a slightly increased risk for having chronic hepatitis B,<sup>8</sup> future RDS studies should select more male seeds aged 20–40 years (to recruit similar peers), and consider to include male researchers. We recommend to consider using RDS to recruit immigrants for research purposes, but also for the delivery of health interventions, such as HBsAg screening, starting at community venues where relatively large numbers of immigrants convene. Future research is needed to assess the cost-effectiveness of RDS in comparison to earlier performed outreach activities to reach immigrants for HBsAg screening.

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#### CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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