Changing Environments and Chronic Disease among Foreign-born People in the U.S. and Belgium

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Abstract

Immigrants are often in better health than native-born people upon arrival, but their health advantages dissipate, especially for chronic diseases. Research has typically conceptualized these changes in health as resulting from exposure to unhealthy Western lifestyles and changes in behaviors with acculturation. We explored these ideas through interviews with 112 refugees and other recently-arrived immigrants across two major immigrant destinations offering different living environments: Atlanta, USA and Brussels, Belgium. Respondents in Atlanta more often identified as overweight or obese and less often as underweight than in Brussels. Respondents in both settings were on average thinner than native-born people; respondents in Brussels were also thinner than those in Atlanta. Across settings, respondents reported adopting new fast/junk foods since migrating and reported changes in grains consumed; in Atlanta, many adopted sodas and sweets. When asked about unhealthy foods, sweets were listed as more frequently in Brussels and fats more frequently in Atlanta.

Introduction

There are over 230 million international migrants worldwide, and this number continues to grow.[1,2] There is considerable political, scholarly, and lay interest in the integration of newly arrived immigrants in Europe and North America, as conflict, poverty, and inequality drive hundreds of thousands of persons each year to look for a better life elsewhere.

Upon arriving in their communities of reception, migrants are often in better health than native-born people in their country of reception and then the average person in their country of origin.[3-8] In the U.S., foreign-born people are less likely than native-born individuals to suffer from heart disease, overweight, obesity and mental disorders, are less likely to suffer or die from several cancers and have lower overall mortality rates.[9-13] In Europe, foreign-born persons are less likely to die from most types of cancers and may have lower cardiovascular mortality.[14-17] However, several studies have also found some foreign-born people to be in worse cardio-metabolic health - cardiovascular disease, diabetes and obesity – and some studies, especially from the U.S. and Canada, have argued that these conditions are less prevalent in foreign-born people on arrival, but that they increase disproportionally with time since arrival.[18-20] That is, with time since arrival, immigrants' health advantages dissipate.[8,21-30] In Europe also, migrants seem to be more vulnerable to obesity, some cardiovascular diseases, and especially diabetes compared with native-born people, though the timing of these conditions has not been studied.[31-34]

Studies especially from English-speaking countries, have indicated that the health of foreign-born people deteriorates with time since migration, especially in terms of obesity and diabetes.[10,30,35,36] In a systematic review of immigrant health in the U.S., we found that all but one study reported a significant, positive relationship between body-weight and duration of residence in the U.S.[30] Increases in weight with duration of residence in the U.S. may be non-linear, with bodyweight being observed substantially elevated after 10 to 20 years of residence in the U.S.[8,21-29] In Europe and other

high-income countries, obesity increases with length of stay have also been indicated among foreign-born people and in their children.[33,37] The origins of these risks are not well understood, but the leading explanations proposed in the literature are summarized below.

Several conceptual models have been proposed to explain the relationships between obesity and migration. Much research, especially in the United States and Canada, has focused on exposure to obesogenic environments, that is, environments that may promote obesity.[38-40] According to this idea, migrant destinations are often places that promote obesity; they have easy access to unhealthy foods, limited access to affordable healthy food options, and both work and leisure opportunities tend to involve sedentary activities, especially sitting in front of a screen. These places have high rates of obesity and other chronic disease among the native-born population, and the longer foreign-born people are exposed to these conditions, the more their weight increases also.

A related explanation for the increases in obesity among immigrants with length of residence focuses on acculturation, or how immigrants' lifestyles and behaviors change when living in these obesogenic environments. According to this explanation, foreign-born people arrive with different eating and activity habits and preferences, which reflect the healthier environments from which they are coming. These healthier habits are more likely to be retained within ethnic enclaves which can somewhat emulate the environment of origin.[38] With time, however, as immigrants assimilate in terms of language acquisition, jobs, and social factors, they also assimilate in terms of lifestyles relevant to obesity. Immigrants adopt ideas, values, and behaviors that are new and different from their former lifestyles.[41,42] These changes may include consuming more energy-dense, processed foods and adopting sedentary lifestyles.[43-50] As a result, after about a decade post arrival into obesogenic environments, foreign-born people have body weights and obesity rates similarly high or even higher than those of the native-born population.[21]

Most of these hypotheses about the relationships between chronic disease and migration have

only been tested empirically to a limited extent, and we are still learning the importance of place of origin, environment of resettlement, and post-migration behavioral changes. The current study contributes to this literature by exploring the experiences of integration in aspects that may be relevant to chronic disease among foreign-born people in two different contexts of reception. Using similar study designs, we conducted interviews in Brussels, Belgium, and in Atlanta, Georgia. These are two leading immigrant destinations but with greatly differing living environments. Georgia, located in the American South, with the area that has been called the Strokebelt, is an archetypical obesogenic environment, with extensive urban sprawl, very limited public transportation and walkability, high density of fast food outlets, and long distances to grocery stores. In Georgia, 31.4% of adults are obese and 14.2%have diagnosed or undiagnosed diabetes. Brussels is a highly walkable city, with extensive public transportation and well integrated with stores and markets offering groceries, as well as fast food outlets. In Belgium, 12.8% of native-born adults are obese and 4.8% have been diagnosed with diabetes. Examining indicators of health and health-related behaviors in people who have relocated into these two different environments provides new perspectives on the role of context of reception for immigrant health.

Methods

Data collection

We developed, tested, and used survey instruments for data collection about health-related behavior and health among refugees in the U.S.; we then adapted the survey instruments for use in Belgium. The survey included a quantitative component, collecting information on demographic and socio-economic characteristics; living arrangements; eating and physical activity; and perceptions of own health and body weight. It also included a qualitative component, in which participants free-listed in response to open-ended questions about food they (used to) have and physical activity they

(used to) do before and after arriving in Belgium/U.S. They were asked about foods and activities they believe are: healthy, unhealthy, and Belgian/American. To elicit information on body weight, respondents were given a card of 8 figures and asked which looks most like themselves. While not noted on the cards, two figures each corresponded to underweight, two to normal weight, two to overweight and two to obesity.

We recruited recently arrived adults in both cities. In Atlanta, we collected data from September 2016 to February 2017 in coordination with a local refugee resettlement office's walk-in legal clinic. Fifty-one foreign-born individuals gave informed consent and participated in 30-minute interviews in English, Spanish, or with assistance of the interpreter. In Brussels, we collected data in June and July 2017 using venue-based sampling at locations with large proportions of immigrants throughout the city. Sixty foreign-born individuals gave informed consent and participated in 30-minute interviews in English or Arabic.

Analysis

Tabulations, correlation analyses and t-tests were used to examine distributions and associations. We use descriptive statistics and multivariate regression analyses to examine relationships between pre- and post-migration lifestyles, ideas, and behaviors that may be linked with chronic disease. We conducted text analysis of the items listed in response to open-ended questions using Dedoose and word clouds to identify themes; synonymous in freelists were collapsed.

As we develop the analysis further prior to PAA, we will examine risk of obesity first in each country separately, with right-hand side variables being gender, age, time since arrival, years of education, family status (living with partner and children; with partner without children; with children without partner; without partner or children), region of origin (Africa, Asia, Middle-East). Then we will pool the sample and add to these country of resettlement (U.S. or Belgium). This

approach will allow us to estimate to what extent country of origin, country of resettlement, in additional to personal characteristics, are associated with weight status. We will follow a similar analytic strategy for health behaviors. We will examine the likelihood of adopting new unhealthy items (fast/processed foods, sweetened beverages) or new healthy items (fruit, vegetables) in the country of resettlement, adjusting for personal characteristics, region of origin, and, in pooled analysis, country of resettlement; and similarly the likelihood of abandoning unhealthy items (fast/processed foods, sweetened beverages) or healthy items from the country of origin. This approach will show whether people from some regions are more likely to adopt or abandon healthy or unhealthy items, and whether those who settle in the more obesogenic city (Atlanta) are more likely to adopt unhealthy items or abandon healthy items than those resettled in the less obesogenic city (Brussels).

Results

Respondents in Brussels were from across 23 countries **(Table 1)**, with the largest number being from Afghanistan (20%); other prominent countries of origin were Somalia, Sudan, Sierra Leone, Congo and Algeria. Respondents in Atlanta were from across 18 countries, with the largest number being from Myanmar (20%); other prominent countries of origin were Thailand, Iraq, Ethiopia, Liberia and Afghanistan. Across both settings, respondents had migrated on average 8 years ago and just under half in both settings had lived in a refugee camp previously. In the U.S., all respondents were refugees; in Belgium, 37% were asylum seekers, 43% were refugees and other legal residents and citizens, while 19% were undocumented. The average age in both sites was 35-36, but family structure was quite different. In Atlanta, the majority of respondents were women (53%), were married (69%) and had children (2 on average), while in Brussels the majority of respondents were men (65%), were unmarried (55%) and few were co-residing with children (15%).

When asked to describe their body weight by identifying the figure that looked most like

them **(Table 2)**, respondents in Atlanta identified themselves most frequently as overweight (45%), with 8% identifying as obese, 8% as, and 39% as normal weight. Respondents in Brussels identified themselves most frequently as having normal weight, with 30% identifying as overweight, 13% as underweight, and 5% as obese. 27% of respondents in Atlanta and 39% of those in Brussels found that their current weight was ideal.

Respondents were asked about the items they used to eat frequently in their home country and which they no longer eat; we will call these abandoned foods. **Table 3** shows the items grouped into food groups while **Figure 1** shows specific answers, with larger items indicating that more respondents selected them. The migration and health literature posits that, with migration, people abandon healthy traditional foods and adopt unhealthy, highly processed new foods. In both countries, a substantial number of people reported that there were no items that they no longer ate (37% in Brussels and 33% in the U.S.). In both countries, over 20% listed grains and 13% listed fruits and vegetables that they no longer eat. In Brussels, many people listed specific ethnic dishes. Thus, we do find that many of the abandoned items were healthy items, as hypothesized. However, some respondents, especially in the U.S., also listed abandoning unhealthy items from their home countries, such as sodas and junk foods that they no longer have in the U.S.

We asked respondents in both settings why they no longer consumed the items they listed **(Table 4)**. The top-listed reason across settings was that they could not find these items; the second-listed reason across settings was that the local version of the item did not taste the same as it did in their home country. Respondents in Atlanta were able to offer more explanations than those in Brussels. Virtually all respondents in Atlanta mentioned reasons having to do with taste and healthfulness, and many also listed social reasons, especially the social meaning of foods and special occasions which are not observed in their new community.

Respondents were then asked about the items they did not eat in their home country but

which they frequently eat now; we will call these adopted foods. **Figure 2** shows specific answers, with larger items indicating that more respondents selected them. In both countries, a substantial number of people reported that there were no items that were new; this was especially the case in the U.S., (54%). In both countries, consistent with the hypothesis about dietary change, the most frequently listed adopted foods were junk foods and street foods (20% in Brussels and 25% in Atlanta) and, especially in the U.S., sodas (19%). Still, many participants also listed adopting healthy items, in the U.S., especially new grains, and in Belgium, especially new fruits and vegetables.

We asked respondents in both settings why they so frequently consumed the new items now **(Table 5)**. The top-listed reason across settings was that these items were very easy to find in their new communities. Affordability was mentioned by some, but not the majority. Respondents in Atlanta were again able to offer more explanations than those in Brussels, and the majority reported the healthfulness of the items being an important reason for consuming; they also mentioned ease of preparation, popularity of the food, and children's preferences as important considerations.

Respondents in both settings could list foods and beverages as healthy and unhealthy **(Figure 3)**. In both settings, when asked to list healthy items, respondents most frequently listed vegetables and fruits, though those in Atlanta did so 20% less frequently than those in Brussels. In addition, Atlanta-based respondents frequently incorrectly listed juice as a healthy item. However, in both settings, water was frequently listed. When asked to list unhealthy items, the main concern in Belgium was around animal products, followed by sodas, juices, and fast foods, while in Atlanta fast food, junk food and sodas were most frequently listed.

Finally, when asked what items they identify with their country of reception **(Figure 4),** respondents across both settings focused on fast foods: in Belgium, half of the foods listed as Belgian were street foods, including fries and meat; in the U.S., a third of foods listed as American were fast foods and junk foods. Many respondents in both settings listed grains, vegetables and

fruits. An interesting pattern is that many of the items identified with the country of reception were items that were actually ethnic foods of earlier waves of immigrants, for example, pasta and Chinese food. Specific items frequently listed in Belgium were potatoes (fried or otherwise) and pasta and lasagna; specific items frequently listed in the U.S. were burgers and juice.

Discussion

Research on immigrant health has often shown high risks of chronic disease among foreign-born people in Western countries. This pattern is often conceptualized as a result of exposure to new, obesogenic environments, into which immigrants assimilate. We tested this proposition by collecting data from 112 refugees and other recently-arrived immigrants across two metropolitan areas that are major immigrant destinations offering different living environments, Atlanta, USA and Brussels, Belgium.

Respondents in Atlanta identified themselves most frequently as overweight (36%), with 22% identifying as obese, and 37% as normal or under- weight. In nationally representative data from U.S. adults, 33% were overweight and 38% obese and only 3.5% were underweight, indicating that our respondents were thinner than the native-born population and more frequently in the normal-weight range. Respondents in Brussels identified themselves most frequently as having normal weight, with 35% identifying as overweight or obese and 13% as underweight. In nationally representative data on native-born Belgian adults, 45% were overweight or obese and only 3.5% were underweight, indicating that our respondents were thinner than the native-born population but fewer were in the normal-weight range.

In both settings, respondents reported adopting new fast foods and junk foods into their diets since migrating and also reported major changes in the types of grains they consumed; in the U.S., many also adopted sodas. Across the two settings, respondents identified junk food, especially pizza,

burgers, and fries, as being representative foods in their new communities; they identified fruits and vegetables as healthy foods; when asked about unhealthy foods, sweets were listed as concerns more frequently in Belgium and fats more frequently in the U.S. A substantial proportion of respondents in the U.S. incorrectly identified juice as a healthy item and less frequently listed vegetables and fruits among healthy items than respondents in Belgium.

The findings from this study are preliminary, and only provide hints of patterns that should be investigated further. The sample size was small in each setting. Data collection in the U.S. had to be terminated early due to political changes that crippled the activities of our community partner; data collection in Brussels was venue-based and not representative due to time constraints on our study team. The two cities selected for analysis offer great examples of the environmental characteristics often discussed in the literature, but two sites do not allow us to examine variability and specific environmental characteristics – a larger, multi-site study will be needed to really answer questions about what components of the environment of reception are most relevant. We did not collect direct anthropometric measurements, so we are relying on respondents' assessments of their own weight; however, the nationally representative data commonly cited, including above, are also from self-reported height and weight.

This cross-sectional study examined patterns of unhealthy weight and health-related behaviors among foreign-born people in two cities that are immigrant destinations in the U.S. and in Belgium. While in both places foreign-born respondents were less frequently overweight or obese than the overall population in their country of reception, the foreign-born respondents living in the U.S. were heavier than those living in Belgium, consistent with the idea of exposure to an obesogenic environment in the U.S. An important step for future research will be to adopt a life course perspective and to take into account pre-, peri- and post- migratory factors, as well as the health status of host and home country populations.[51,52] This is particularly relevant because the emergence

of chronic diseases is likely to be multifactorial, including patterns of childhood deprivation (pre-migration experience), stress during migration (per-migration experience), and health in the countries of settlement (post-migration experience).

Examining how newly arrived immigrants adopt ideas, values, and behaviors that can change their risks of chronic diseases can be an approach to understanding and addressing inequalities in health. More broadly, understanding the health patterns of migrants can be useful in identifying their specific health needs, as well as contributing to our understanding of how specific environments, changes in environments, and individual health endowments intersect to shape the long-term health of populations.

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Tables and Figures

Table 1. Characteristics of foreign-born individuals from Brussels (n=60) and Atlanta (n=51)

	Brussels	Atlanta
	Mean or %	
Country of Origin		
Number of Countries	23	18
Afghanistan	20%	6%
Algeria	5%	-
DR Congo	5%	6%
Ethiopia	-	8%
Iraq	-	10%
Liberia	-	6%
Myanmar	-	20%
Sierra Leone	5%	-
Somalia	9%	-
Sudan	8%	-
Thailand	-	12%
Lived in Camp	47%	43%
Years in country of reception	8 (.08-12)	8 (.02-24)
Migration Status		
Refugee or asylum seeker	37%	100%
Legal resident or citizen	43%	-
Undocumented	19%	-
Age	35 (18-71)	36 (18-65)
Married	45%	69%
Female	35%	53%
Children		
Total number	1.4	2.0
Co-residing currently	15%	75%

Table 2. Self-identified bodyweight of foreign-born individuals in Brussels (n=60) and Atlanta (n=51).

	Brussels (%)	Atlanta (%)
Self-identified weight		
Underweight	13	8
Normal weight	40	39
Overweight	30	45
Obese	5	8

Table 3. Food groups from which foreign-born individuals identified items that they no longer eat (*abandoned*) and that they now have started to frequently eat (*adopted*) after migration

	Brussels	Atlanta
	%	
Abandoned Foods		
Dairy and Eggs	4	7
Ethnic Dishes	27	-
Street Food/Fast Food/Junk Food	-	8
Grains	20	27
Meat and Fish	10	10
Sweets and Sodas	2	13
Vegetables and Fruit	13	13
Can find everything	37	20
Adopted Foods		
Alcohol and cigarettes	7	-
Dairy and Eggs	4	3
Ethnic Dishes, Pasta and Pizza	20	-
Street Food/Fast Food/Junk Food	20	25
Grains	4	22
Meat and Fish	12	15
Sweets and Sodas	7	19
Vegetables and Fruit	15	13
Nothing new	18	54

Note: Multiple responses were possible, so percentages to not add to 100%.

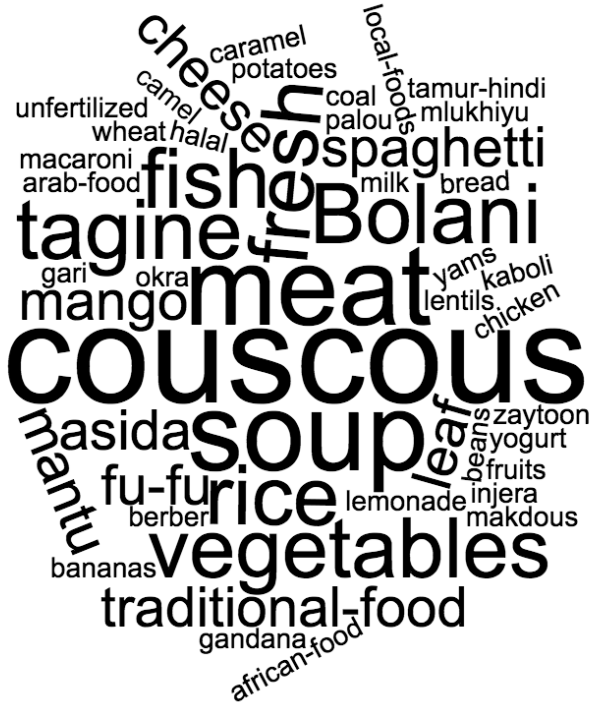
Table 4. Reasons foreign-born individuals listed for no longer consuming items from home country in Brussels (n=60) and Atlanta (n=51).

	Brussels (%)	Atlanta (%)
Access		
Can't find	37	53
Too far, no transportation	-	6
Too expensive	5	11
Taste and healthfulness		
Not same taste	18	51
My tastes changed	2	40
The food is unhealthy	3	11
Social Reasons		
Social events at which food is eaten do not occur here	5	4
Food is not popular here	6	24
Food smells bad to neighbors	-	8
Partner or child does not like it	-	7
Preparation-related reasons		
Too busy to prepare	3	17
Lack utensils for preparing	3	9

Table 5. Reasons foreign-born individuals listed for consuming new items in country of reception [Brussels (n=60); Atlanta (n=51)].

	Brussels (%)	Atlanta (%)
Access		
Easy to find	46	78
Can find close by or have easy transportation	-	42
Affordable	15	49
Served in asylum center	14	n/a
Taste and healthfulness		
My tastes have changed	2	47
Food is a treat	9	25
The food is healthy	5	63
Social Reasons		
Eaten socially here	12	37
Food is popular here	12	58
Partner likes food	3	33
Child likes food	15	59
Cooks for job	2	-
Preparation-related reasons		
Easy to cook	11	49
Can be prepared with local utensils	3	31
Doesn't cook	2	-

Figure 1. Word clouds illustrating the items foreign-born individuals identified as being from their home country which they no longer eat defined as *abandoned*.
1.a. In Brussels (n=60)



1.b. In Atlanta, US (n=51)

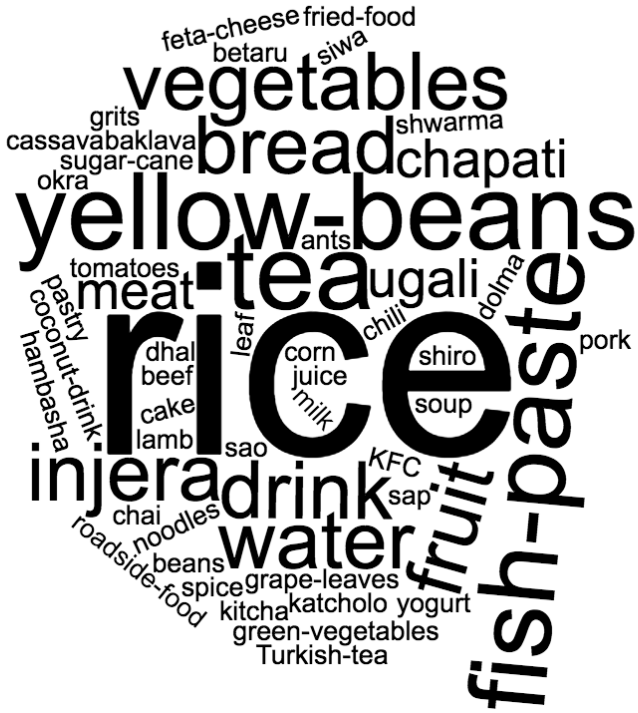


Figure 2. Word clouds illustrating the items foreign-born individuals identified as items they eat now which they did not eat in their home country defined as *adopted*.
2.a. In Brussels (n=60)

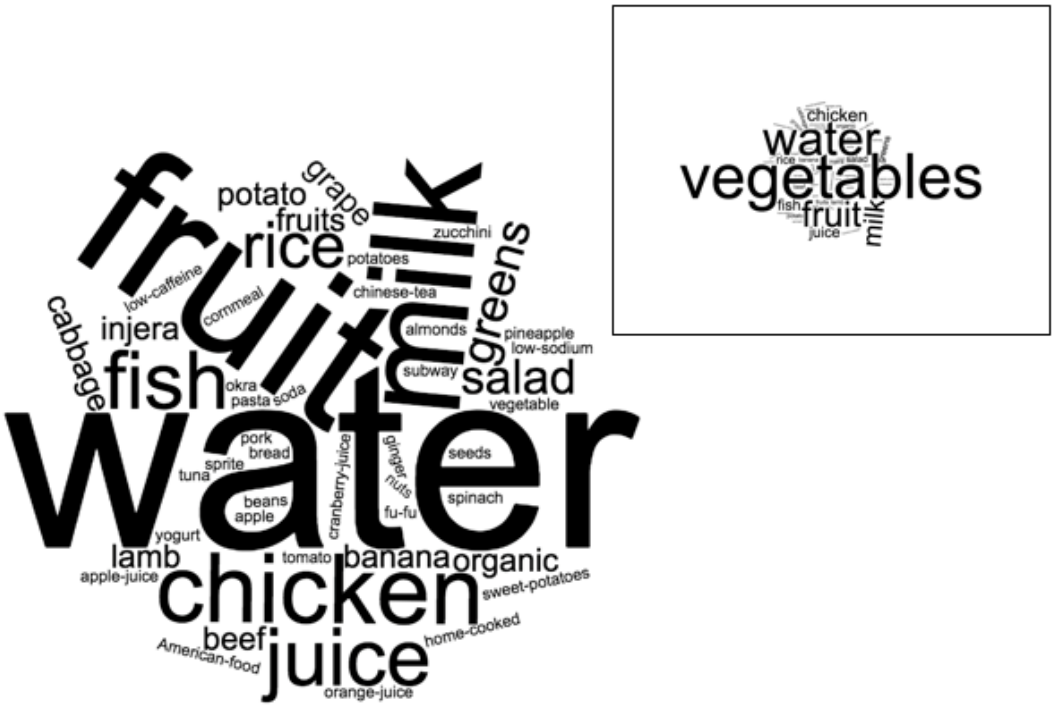
2.b. In Atlanta, US (n=51)

Figure 3. Word clouds illustrating the terms *healthy* and *unhealthy* as defined by foreign-born individuals residing in Brussels or Atlanta.

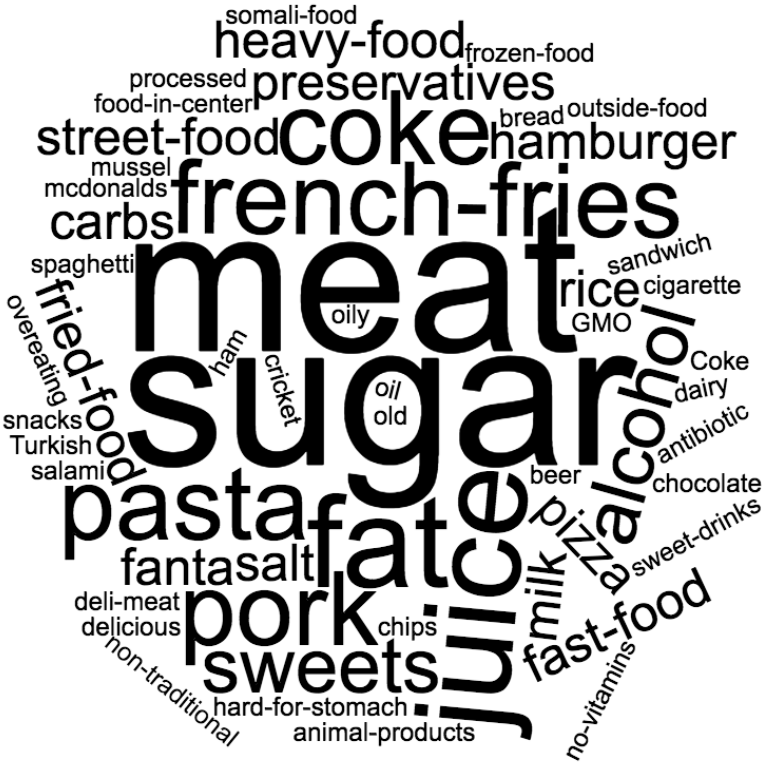
3.a. Definition of healthy in Brussels (n=60)

Note: In situations where one word was so dominant that it made the others hard to read, we are showing the figures both with and without that word.

3.b. Definition of healthy in Atlanta (n=51)



3.c. Definition of unhealthy in Brussels (n=60)



3.d. Definition of unhealthy in Atlanta (n=51)

Figure 4. Word clouds illustrating the items foreign-born individuals identified with their country of reception.

4.a. In Brussels (n=60)

4.b. In Atlanta, US (n=51)