**Supplementary Text 1: Additional information on study setting**

The study was carried out in Hamilton, Ontario, Canada, a socio-demographically diverse city of ~750,000. The city is similar in composition to the rest of Canada in regards to rates of low income, recent immigration, and racialization. Hamilton has rates of hypertension, diabetes, overweight, and obesity higher than the national averages, even though it represents an urban centre. The summary statistics highlighting key indicators of the city’s demographic and health composition in relation to Canada’s are presented in S Table 1.

**Supplementary Table 1:** Socio-demographic and health profile of Hamilton, Ontario, Canada compared to Canada’s socio-demographic and health profiles. All data derive from Statistics Canada. If not otherwise indicated, data are from 2019 reports.

|  |  |  |  |
| --- | --- | --- | --- |
| Demographic or health indicator | | Percent of Hamilton’s population | Percent of Canada’s population |
| Household income classification | Low income1 | 13.0 | 14.2 |
| Immigration status | First generation Canadian | 25.5 | 23.9 |
| Has lived in Canada < 5 years | 2.37 | 3.52 |
| Racialization | Non-Minority | 82.8 | 77.7 |
| Visible Minority2 | 17.7 | 22.3 |
| Indigenous (First Nations, Métis, or Inuit) | 3.0 | 6.18 |
| Body Mass Index (BMI)3 | BMI <25.0 | 39.6\* | 44+ |
| 25.0 < BMI < 30 | 38.6\* | 34+ |
| BMI > 30 | 21.8\* | 20+ |
| Prevalence of common Non-Communicable Diseases | High blood pressure | 22.1\* | 17.3+ |
| Diabetes diagnosed at any time during census respondents’ life course | 7.5\* | 6.9+ |
| Diabetes diagnosed during pregnancy | -- | 17.3+ |
| Early life health indicators | Prevalence of low birth weight4 | 5.8 | 6.5 |
| 1Based on Statistics Canada’s Low Income Measure (50% of Canadian median household income after taxation, adjusted for family size).  2Includes any non-Indigenous people who do not identify as white/Caucasian in colour/race.  3Calculated from census respondents’ height (m) and weight (kg): BMI=weight/height2.  4Babies born weighing less than 2.5 kg.  \*Data are from 2013 report.  +Data are from 2016 report. | | | |

**Supplementary Text 2: Notes on the composition and qualifications of the research team and its members and on study limitations**

*About the research team composition:* The research team comprises a set of academic experts and trainees as well as community partners with skills spanning health psychology, fetal physiology, anthropology, and public health policy and administration. All authors, particularly the non-academic partners who are local leaders in public health, contributed to identifying the focus group discussion topics, and to forming and tailoring the questions to local participants. The first author took the lead with respect to data collection, running both all focus group discussions and organizing the stakeholder engagement meeting; the stakeholder meeting was run by a trained, experienced, facilitator, with strong ties to the community. [First author’s name removed for peer-review] holds a PhD in anthropology and has nearly a decade of training and experience in collecting mixed health and demographic data under anthropological field conditions. Nonetheless, [the first author] had only limited prior experience with running focus groups prior to this project, so [the lead author] received support and supervision from [his/her/their] senior colleague [author’s name removed], who also holds an anthropology PhD and who has designed and run dozens of focus groups concerning maternal and child health over the last two decades. Transcription was done by trainee members of the team (one master’s student, two recent BA undergraduate research assistants). Analysis sessions were led mainly by the paper’s senior author [name removed for peer-review], who is a leading health psychologist and who has two decades of experience collecting and analyzing focus group discussion data, and specifically with carrying out thematic network analysis. All authors participated in at least two of the iterative discussions that yielded the two thematic maps reported in the main text. All authors contributed to framing the manuscript, which was then drafted by the lead author and by the senior author, and subsequently edited and approved by all authors.

*About study methodological limitations*: While the approach we took to this study, namely one that focuses on building relationships through formative work and otherwise engaging deeply with community members and local partners, is crucial to the development of complex health and nutrition interventions, we acknowledge that the study nonetheless has several important limitations. In particular, this study was qualitative and based on only a small–and largely self-selected–subset of potential pregnant/post-partum participants. One of our aims is to support pregnant people in Hamilton experiencing vulnerabilities, but it is likely that the *most* vulnerable people (e.g., those who are housing insecure, those who are facing severe mental health challenges, those newcomers who did not speak enough English to understand study announcements and promotional materials) are not in a position to participate in research studies like ours. These severe barriers were probably not surmounted by the measures we took, including compensating participants financially for attending focus group discussions, and doing our best to translate study promotion into key languages spoken in newcomer populations (Arabic, French, Mandarin). Given these likely biases in our data collection strategy, our findings about the highest priority pregnancy nutrition/health issues and about the most desirable intervention strategies cannot be generalized. Hearing the voices of the most vulnerable and reaching them with support may require a different set of more resource-intensive strategies, that involve meeting them where they are (literally and metaphorically).

A second shortcoming of our work concerns our selection of topics and questions for the focus group discussions, as well as our data coding approach. Both data collection and coding were not “bottom-up” –they were driven largely by researchers and public health partners–and thus may not reflect the biggest priorities of vulnerable pregnant people. To partly circumvent this issue, we asked mainly open-discovery questions, giving participants room to come at the broad topics of pregnancy nutrition and health in ways that align with their frames of reference and their priorities. But, we were nevertheless clear that pregnancy nutrition in relation to health equity was our main area of interest and expertise. Doubtless, a truly bottom-up study with the same set of participants during the same life stages would have produced a different set of priorities regarding supports needed.

Lastly, we note that our *a priori* interest in structural determinants of inequities led us to weight these themes relatively heavily in our framing of this paper, and in the conclusions we reached. Our hunch is that a grounded-theory-based analysis of the transcripts may have produced near equal weighting (as regards amount of discussion time/words) on individual characteristics/motivations/behaviours versus structural/environmental ones as determinants of pregnancy diet. But, we know from our own previous work and from that of others that heavily emphasizing the role of the individual can be counterproductive to improving pregnancy health equity. So, we chose to foreground environmental factors in both the introduction and conclusion of this paper, but we caution the reader that this is only one reading of the data.

**Supplementary Text 3: Methodological notes on and additional data generated by the stakeholder meeting**

We did not conduct a formal thematic network analysis of the stakeholder meeting notes. As such, no themes or related illustrative quotes emerged from the stakeholder engagement meeting portion of the study. However, via the last full-group discussion of the stakeholder meeting, we collected and organized pregnancy health priorities for the city, identified through break-out small group discussion sessions. These priorities comprised responses to the question: What major issues that affect diet and wellbeing are facing pregnant people in Hamilton? As a full group, we clustered these responses under three main sub-headings. These were: *Communication and Awareness*, *Services and Service Integration*, and *Access and Affordability*. *Communication and Awareness* describes all issues around sharing information across services in relation to supporting young families. It also encompasses difficulties in relaying and making sense of diet-related information, information about available services, and information about pre- and peri-conception care for mothers. *Services and Service Integration* reflects disconnects between various city services and policies targeting PPPs, presenting barriers and highlighting gaps for both HSCPs and PPPs. *Access and Affordability* refers to issues regarding access to resources for PPPs, including income, food, and services, mainly at an individual or household level. The specific issues identified by stakeholders, bulleted under the three sub-headings, are presented in S Table 2.

We note that all of the issues foregrounded by stakeholder meeting participants focused on structural barriers to being healthy and eating well during pregnancy.

**Supplementary Table 2:** Responses from participants in the stakeholders engagement meeting to the question: What major issues related to nutrition and wellbeing are pregnant women in Hamilton facing? The sub-headings were identified during the meeting with input from the full group of stakeholders.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Communication and Awareness | Services and Service Integration | Access and Affordability |
| Issues spanning all sub-heads | * Need to address anxiety, feelings of isolation, and other mental health-related issues during pregnancy * Need for universal, integrated, and relatable early education in food, health, and finances | | |
| Issues spanning Communication and Awareness and Services and Service Integration sub-heads | * Lack of peer support * Lack of awareness of existing programs and services | |  |
| Issues falling under one sub-head | * Failures to communicate effectively * Conflicting messages * Inadequate preconception care and knowledge | * Policies that do not prioritize mothers, families * Fractured city and provincial services | * Insufficient income to meet (many) families’ needs * Competing priorities: food versus housing, utilities, transport, etc. * Unaffordability of transport and parking * Lack of access to affordable, quality childcare |

**Supplementary Appendix 1: Focus Group Interview Guides**

**Focus Group Question Guide: PPP**

Preamble:

My name is\_\_\_\_\_and this is \_\_\_\_\_ [add a little about who researchers are personally]. We’re part of the [Study#name] Research team, based mainly out of McMaster University. [Study#name] is about trying to make sure pregnant people and families with young children get as much help and support as they need and want towards growing healthy babies and kids. To do this, we want to hear from you so, we’re about to sit down and talk about some of these things over the next two hours. We have some questions prepared to keep the flow of the discussion going but we’re also happy to let you set the pace and raise your own questions and issues if that seems like it’s going to be more fruitful.

In front of you, you’ve got a package with a little information about us, links to different resources, etc. There’s also a letter of information and a consent form. So, before we can get started, we’re going to have a look at that.

We’re not going to go through every line of the letter with you but we’re going to quickly sum up some of the main points. The first part tells you what we just told you (about who we are and what we’re hoping to do).

The next part tells you a little about the possible conflicts, risks, and benefits involved in doing this research, both for the researchers and for you. In short, we don’t have any conflicts of interest: we won’t be benefitting financially or politically from doing this, although it is good experience for us in terms of our professional development.

In terms of direct benefits to you from participating in this study, we will be paying you $25 for your time, in the form of a visa gift card. In addition to the $25, we expect the discussion to be fun and interesting, a way to discuss pressing issues facing your community, your family, and your experiences. In the longer term, we hope getting this conversation going will lead to possibilities to really work together to try to make a difference in the lives and health of people in Hamilton.

There are no physical risks to you during participation. We will simply be sitting and chatting for up to about two hours. We also don’t think there are likely to be any serious social or psychological consequences. But, some people don’t always feel 100% comfortable speaking in this kind of environment so, if you feel in any way uncomfortable at any time, we’d just like to reassure that it’s fine to skip over a question or a group of questions, or to remove yourself from the room for a bit, and still be a part of the study.

As for what’s going to happen with your data if you decide to participate? Well, in the short term, we’ll take out any individual identifiers like your name, your age, and your postal code (so we and other people won’t know who said what or when) and then analyze the words you share to identify key themes that come up over the course of this session and the other sessions we’re running around the city over the next little while. We’ll share and discuss results of these analyses with you (if you’re interested) as soon as we have done them. We’ll also share anonymized versions of these analyses with other scientists and with the wider public over the next year or two. After we’ve done these kinds of things, we’ll keep the data on file for up to five years. After five years (i.e. by [insert date five years in the future here]), we’ll shred any remaining paper files and completely destroy any electronic ones.

So, if all of this sounds reasonable to you and you’d like to participate in this interview, we’ll give you a few minutes to read through some of the additional details and to sign the consent form, which is attached to the back of the letter. Please feel free to ask questions and to take your time while looking through the letter of information and the consent form.

I should just note that we’re planning on recording this session so, if there are no objections to that, I’ll begin recording now.

[For the tape: we’re at\_\_\_\_\_(location/centre name) on \_\_\_\_\_(date). There are \_\_\_\_\_(#) participants in attendance.]

[When answering questions, please identify your voice for the tape, either by first name or by the participant number that’s on your informational package, whichever feels more comfortable for you.]

*Part A: Personal Opening Questions*

Please tell us a little bit about yourself.

* Probes:
  + How long have you lived in Hamilton?
  + Are you a regular visitor to this community centre? Do you visit other ones?
  + [Is this your first pregnancy?]
  + Is there anything else you want to tell us about yourself or who you are?

*Part B: Questions pertaining to how pregnant women interact with community health workers, ECEs*

What conversations do you have about pregnancy or about women’s health?

* Probes:
  + Do you ever talk to OEYC ECEs, nurses, or dietitians about health and lifestyle?
    - If so, what do you talk about?
    - If not, why not?
  + Who do you usually ask for advice about health?
    - Doctor, community health nurse, midwife, doula?
    - Friends, family?
    - Use social or trad media?
  + Do you ever try to initiate conversations with community centre staff about your pregnancy?
    - If yes, what are the most important topics that you bring up?
    - If not, why not?

To what extent do your family members or friends come with you to prenatal classes, other prenatal activities, OEYC drop-in sessions etc.?

* Probes:
  + Who? E.g. Partner, biological father, etc…
  + Do family members get engaged?

Who in your life might have a role in supporting health and nutrition for mothers, fathers, pregnant people?

* Probes:
  + Outside of standard care providers, like doctors, nurses, midwives?
    - Limitations of standard care providers?
  + ECEs at OEYCs?
  + What might that person’s/ those peoples’ role be?

What services, [beyond what’s offered at the group], could help you have a healthy pregnancy?

*Part C: Questions about mothers’ knowledge of health and health behaviours during pregnancy*

What are your thoughts or concerns about healthy diet during pregnancy?

To what extent did you think about a healthy diet before you were pregnant?

* Probes:
  + Are there any specific foods to avoid?
    - Why?
  + To eat more of?
    - Why?

How much do you think you know enough about pregnancy nutrition and health?

* Probe:
  + Do you feel you’ve learnt enough about it, or do you want more information on pregnancy nutrition?
  + If you want more information, in what form and from whom?

What do you think the consequences of mothers or fathers not eating a healthy diet (especially during pregnancy or just before pregnancy) might be?

* Probes:
  + What about in the longer term, as babies become kids and then eventually grow up?
  + What about things other than health, like educational achievement?

*Part D: Questions about challenges, opportunities, and future directions for improving health in women and families of reproductive age*

If you feel comfortable sharing, what kinds of life challenges are you facing right now?

* Probes:
  + E.g. employment, housing, bureaucracy, health/illness, relationship/social belonging?

What challenges do you have when trying to eat healthfully?

* Probes:
  + Are there any challenges that might be unique to this city or to this neighbourhood?
  + Or to this period of time (e.g. political climate)?
  + What are some of the specific things women talk about as representing barriers to eating healthfully:
    - Income? Cash flow?
    - Physical access to food outlets? Transportation, etc.
    - Time?
    - Picky older children?
    - Lack of social support?
    - Partner absence? Partner does not contribute enough to housework and food preparation?

What do you think might be effective way(s) to support healthful eating for women during pregnancy?

What do you think might be effective ways to support healthful eating of whole families?

What supports do you think pregnant people should have when trying to eat healthfully? What would be useful for you personally?

* Probes:
  + Spouses, family members?
  + Apps or digital tools?
  + Community programs with nutrition programming?
  + Community group food preparation?
  + More integrated ways of sharing health information between services and service providers?

**Focus Group Question Guide: HSCPs**

Preamble:

My name is\_\_\_\_\_and this is \_\_\_\_\_ [add a little about who researchers are personally]. We’re part of the [Study#name] Research team, based mainly out of McMaster University. [Study#name] is about trying to make sure pregnant people and families with young children get as much help and support as they need and want towards growing healthy babies and kids. To do this, we want to hear from you so, we’re about to sit down and talk about some of these things over the next two hours. We have some questions prepared to keep the flow of the discussion going but we’re also happy to let you set the pace and raise your own questions and issues if that seems like it’s going to be more fruitful.

In front of you, you’ve got a package with a little information about us, links to different resources, etc. There’s also a letter of information and a consent form. So, before we can get started, we’re going to have a look at that.

We’re not going to go through every line of the letter with you but we’re going to quickly sum up some of the main points. The first part tells you what we just told you (about who we are and what we’re hoping to do).

The next part tells you a little about the possible conflicts, risks, and benefits involved in doing this research, both for the researchers and for you. In short, we don’t have any conflicts of interest: we won’t be benefitting financially or politically from doing this, although it is good experience for us in terms of our professional development.

You will not receive any financial compensation for participating in this study, but we expect the discussion to be fun and interesting, a way to discuss pressing issues facing your professional self, your colleagues, and your community. In the longer term, we hope getting this conversation going will lead to possibilities to really work together to try to make a difference in the lives and health of people in Hamilton.

There are no physical risks to you during participation. We will simply be sitting and chatting for up to about two hours. We don’t think there are likely to be any social or psychological consequences. But, some people don’t always feel 100% comfortable speaking in this kind of environment so, if you feel in any way uncomfortable at any time, we’d just like to reassure that it’s fine to skip over a question or a group of questions, or to remove yourself from the room for a bit, and still be a part of the study.

As for what’s going to happen with your data if you decide to participate? Well, in the short term, we’ll take out any individual identifiers like your name, your age, and your postal code (so we and other people won’t know who said what or when) and then analyze the words you share to identify key themes that come up over the course of this session and the other sessions we’re running around the city over the next little while. We’ll share and discuss results of these analyses with you (if you’re interested) as soon as we have done them. We’ll also share anonymized versions of these analyses with other scientists and with the wider public over the next year or two. After we’ve done these kinds of things, we’ll keep the data on file for up to five years. After five years (i.e. by [insert date five years in the future here]), we’ll shred any remaining paper files and completely destroy any electronic ones.

So, if all of this sounds reasonable to you and you’d like to participate in this interview, we’ll give you a few minutes to read through some of the additional details and to sign the consent form, which is attached to the back of the letter. Please feel free to ask questions and to take your time while looking through the letter of information and the consent form.

I should just note that we’re planning on recording this session so, if there are no objections to that, I’ll begin recording now.

[For the tape: we’re at\_\_\_\_\_(location/centre name) on \_\_\_\_\_(date). There are \_\_\_\_\_(#) participants in attendance.]

[When answering questions, please identify your voice for the tape, either by first name or by the participant number that’s on your informational package, whichever feels more comfortable for you.]

*Part A: Questions about the participants*

Please tell us a little bit about yourself.

* Probes:
  + What’s your occupation and how long have you been doing it?
  + How long have you been involved with Welcome Baby?
  + Is there anything else you want to tell us about yourself or who you are?

*Part B: Questions pertaining to practice of health workers in relation to conversations with pregnant people*

What do you most often talk to mothers about?

* Probes:
  + Health and nutrition?
  + Family and social life?
  + Politics?
  + Money and economics?
  + Participant registration information package? Formal teaching topics and/or evidence-based Health Curriculum Resources?
  + Other things?

What kinds of conversations do you have with pregnant people about the challenges they face?

* Probes:
  + what kinds of challenges do women talk about?
  + who initiates these conversations - you, the expectant mother, a third party?
  + Picturing a memorable conversation with a pregnant woman, how did it feel in terms of tone [disorganized and anxious? Clear and specific?]?

To what extent do you find yourself interacting with the family members of pregnant people?

* Probes:
  + Partner, biological father, etc…
  + What do you most often talk to family members about?
    - Do you ever talk about health and nutrition during pregnancy with family members?
  + Is it ever difficult to interact with family members and, if so, why?

How comfortable do you feel talking with women about their health?/ Advising them on their health?

*Part C: Questions about health worker baseline knowledge of health during pregnancy*

What do you think a healthy diet for a pregnant woman or for a woman who is likely to become pregnant soon should look like?

* Probes:
  + Are there any specific foods to avoid?
    - Why?
  + To eat more of?
    - Why?

What kind of continuing education have you taken recently on women’s health and nutrition during pregnancy?

* Probes:
  + Where did you take them?
  + What kinds of things did you learn about?
  + Did you find the classes/training useful?
  + If not, where have you mainly gotten your information about women’s health and nutrition?

What do you think the consequences of mothers or fathers not eating a healthy diet (especially during pregnancy or just before pregnancy) might be?

* Probes:
  + What about in the longer term, as babies become kids and then eventually grow up?
  + What about things other than health, like educational achievement?

Are there critical times in a woman’s life when she should be eating healthier?

* Probes:
  + For the babies’ health.
  + Why?

*Part D: Questions about challenges, opportunities, and future directions for improving health in women and families of reproductive age*

What challenges do you think pregnant people and new mothers have when trying to eat healthfully?

* Probes:
  + Are there any challenges that might be unique to this city or to this neighbourhood?
  + Or to this period of time (e.g. political climate)?
  + What are some of the specific things women talk about as representing barriers to eating healthfully:
    - Income? Cash flow? Time?
    - Picky older children?
    - Lack of social support?
    - Partner absence? Partner does not contribute enough to housework and food preparation?

What supports do you think women should have when trying to eat healthfully?

* Probes:
  + Spouses, family members?
    - If spouses, family members important, what are your thoughts about how to recruit them for focus groups of their own, and/or to get them engaged?
  + Community programs with nutrition programming?
  + Community group food preparation?

What do you think might be effective way(s) to support healthful eating for women during pregnancy?

-Have you used any tools to support women in Welcome Baby?

-May we show you some digital support tools? (10 mins)?