

# The Canadian Birth Place Study: Development, Validation and Administration of a Questionnaire for Multi-disciplinary Maternity Care Providers

*Canadian Birth Place Study : Conception, validation et administration d'un questionnaire destiné à des fournisseurs de soins de maternité issus de multiples disciplines.*

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## ABSTRACT

The debate between professional groups in Canada about the advisability of planned home birth continues. The Canadian Birth Place Study examines Canadian registered midwives', family physicians', and obstetricians' experiences with and attitudes towards planned home birth, as well as factors associated with in those attitudes. Evidence based strategies were applied to the development, validity testing, and implementation of a cross-sectional questionnaire to a multi-disciplinary sample of maternity care providers.

The survey questions and attitude scale items were adapted from a previously validated questionnaire and reviewed by two discipline-specific expert panels. Experts provided qualitative comments and rated each socio-demographic and attitude item on three 4-point Likert-type scales to evaluate importance, clarity, and relevance. Aggregated scores (content validity indices) demonstrated strong content validity of items. The questionnaire construction and administration plan incorporated best practices for increasing response rates among healthcare providers, as well as participation from multiple perspectives on a controversial topic across study populations.

## KEY WORDS

*Validation Studies, Survey Methodology, Inter-professional relations, Home Childbirth, Parturition.*

*This article has been peer-reviewed.*

## RÉSUMÉ :

Le débat se poursuit entre les groupes professionnels canadiens quant au bien-fondé de l'accouchement planifié à domicile. La Canadian Birth Place Study se penche sur l'expérience et les attitudes des sages-femmes autorisées, des médecins de famille et des obstétriciens canadiens en ce qui a trait à l'accouchement planifié à domicile, ainsi que sur les facteurs associés à ces attitudes. Des stratégies factuelles ont été utilisées pour la conception, l'évaluation de la validité et la mise en œuvre d'un questionnaire transversal auprès d'un échantillon multidisciplinaire de fournisseurs de soins obstétricaux.

Les questions et les éléments de l'échelle sur les attitudes ont été adaptés à partir d'un questionnaire déjà validé et analysé par deux comités d'experts œuvrant spécifiquement dans le domaine. Les experts ont fourni des commentaires qualitatifs et ont attribué une cote à chacune des caractéristiques sociodémographiques et



à chacun des éléments d'attitude en fonction de trois échelles en quatre points de type Likert, et ce, de façon à en évaluer l'importance, la clarté et la pertinence. Les cotes cumulatives (indices de validité du contenu) ont révélé une forte validité du contenu des éléments. La construction du questionnaire et son plan de mise en œuvre ont été fondés sur des pratiques optimales en vue d'augmenter le taux de participation des fournisseurs de soins et de favoriser l'obtention de multiples points de vue, issus de toutes les populations à l'étude, relativement à un sujet controversé.

## MOTS-CLÉS :

*Études de validation, techniques d'enquête, relations interprofessionnelles, accouchement à domicile, parturition.*

*Cet article a été évalué par des pairs.*

## INTRODUCTION

Planned home birth with registered midwives became available as a birth option for women in Canada when midwives were added to regulated health professions in 1993, starting in Ontario. Well designed, Canadian prospective<sup>1</sup> and retrospective<sup>2</sup> cohort studies and a large national cohort study from the Netherlands (n=529,688)<sup>3</sup> suggest that planned home birth for low-risk women is as safe as hospital birth and is associated with fewer perinatal interventions. These studies were conducted within healthcare systems that include infrastructure for timely transfer to hospital, when necessary, and for communication and consultation between professional groups providing obstetrical care: midwives, obstetricians, and family physicians, and maternity nursing staff. Some clinicians and researchers note that those conditions may not be available in every region of North America, and others question whether it is appropriate to draw decisive conclusions about home birth safety based on findings from observational studies. Thus, debate between professional groups about the advisability and safety of planned home birth persists.<sup>4-9</sup>

The attitudes of providers who interact with pregnant and labouring women may significantly affect the quality of care and access for women who consider or choose to birth at home.<sup>10-13</sup> There have been a limited number of studies on provider attitudes towards home birth.<sup>14-17</sup> The only study of multi-disciplinary Canadian providers' attitudes to date analyzed a six item scale related to safety by

mode or place of birth and found that attitudinal scores of doulas and midwives were most favourable towards both home birth and vaginal delivery, followed by nurses and family practitioners, with obstetricians having the least favourable view of home birth and vaginal delivery<sup>9</sup> especially the younger generation.<sup>8</sup> While these data provide some insights, the study did not include any assessment of socio-demographic, education, or practice experience factors potentially associated with attitudes, nor did it provide details about how safety associated with place of birth may be defined by different respondents.

Vedam et al. developed and assessed the psychometric properties of a survey instrument, which combine socio-demographic and an attitudinal scale (the Provider Attitudes to Planned Home Birth Scale, or PAPHB).<sup>18</sup> This study measured attitudes towards planned home birth and examined the predictors of these attitudes in a single provider group, Certified Nurse-Midwives (CNMs) in the United States.<sup>18</sup> This survey instrument was shown to have content validity through systematic assessment by an expert panel, and was subjected to thorough psychometric testing using a large sample of American CNMs (N=1893).<sup>15,18</sup>

The Canadian Birth Place Study, funded by the Canadian Institutes for Health Research, builds on this previous work by Vedam et al. and examines Canadian maternity care providers' attitudes towards and experiences with planned home birth, and factors correlated with these



*attitudes*. In this paper we report on two phases of the study: (1) adaptation, expert review and content validation of an existing instrument developed by Vedam to the multidisciplinary Canadian context; and (2) administration of the questionnaire to Canadian midwives and physicians. More specifically, we describe the development and content validation of an attitude scale and survey instrument, the sampling strategy, and questionnaire administration methods used for this multidisciplinary study, as well as some unique challenges that arose as a result of the multidisciplinary nature of the surveyed population.

## STUDY METHODS

The research team followed an evidence based approach to adapt the CNM questionnaire into two survey versions which would be applicable to multidisciplinary maternity care providers in Canada. The overall structure was maintained to include demographic, educational background, and practice experience sections, as well as a section with attitude statements related to planned home birth rated on five point Likert scales. Additional items were added or deleted in order to focus on those findings that were most significant in the CNM study, to address the unique characteristics of the Canadian context, and/or to include items specific to physicians. Wherever appropriate, the research team maintained exact wording of the attitude scale items from the US study to preserve the use of validated items.

To allow for aggregation of responses and matched comparisons across provider groups and jurisdictions, congruence between the physician and midwifery versions was preserved whenever mutually relevant items existed. The vast majority of questions were identical for both professions. A small number of different questions were added to each questionnaire to elicit unique elements of professional preparation and practice by provider group. Refer to <http://birthplacestudy.ca/dev/> to view the full survey instrument.

### *Expert Review and Content Validation*

Content validation is a process through which

researchers can assess the extent to which a measure adequately represents all components of an identified *construct*.<sup>19</sup> A construct is often a broad and complex social concept, such as depression or love. The identified construct for this study is was 'attitudes towards home birth'. Content validity is one element of *construct validity*, which also assesses the extent to which the measure in question is similar to other measures of the same construct (*convergent validity*), and how different the measure in question is from measures of other constructs (*discriminant validity*).<sup>19</sup> Because 'attitudes towards planned home birth' have not been widely studied, we were not able to assess convergent or discriminant validity. For the purposes of adapting a previously developed tool to the Canadian, multidisciplinary context for the Canadian Birth Place Study, content validity was the most important assessment.

As the content validity of an instrument can deteriorate over time and across populations,<sup>19</sup> new expert review of the modified instrument was merited. The research team identified a list of potential expert panel members who had experience and expertise relevant to maternity practice across birth sites in various regions of the country. The team undertook careful review of the expert panel members to ensure representation and balance in terms of profession, expertise, and regional profile.

There is no consensus regarding the optimal number of experts that comprises a review panel, though researchers suggest anywhere between two and 20 and confidence in the content validity of an instrument increases with the number of experts.<sup>19, 20</sup> Content validation often includes instrument review by a panel of experts (expert review) as well as review by a sample of the target population (population review).<sup>20</sup> In this study, these two review processes were combined, as the members of the expert panels are both content experts and members of the target population. As recommended by content validation literature,<sup>19</sup> we solicited both quantitative and qualitative evaluations from the expert panel.

The research team sent surveys to 58 identified content and instrument development experts,



distributed equally among two panels (one for each survey version). A total of 27 experts agreed to evaluate the survey instrument. Fourteen were on the final panel that evaluated the midwifery survey and 13 experts were on the panel that evaluated the physician survey. The panels included all types of maternity care and public health professionals and researchers in urban, rural, and remote geographical areas.

Each survey item was rated by the expert panel members on three 4-point Likert-type scales to assess Importance, Relevance, and Clarity. Item-level content validity indices (I-CVIs) and an overall scale CVI (S-CVI) were calculated based on these categories. CVIs were calculated by dividing the number of times an item was rated 3 or 4 (where 3 indicates a strong question that needs minor revisions, and 4 indicates a very strong question as-is) by the total number of expert panel members. CVIs are acceptable at .80 for items and .90 for scales.<sup>20-23</sup>

For each survey version, item level CVIs were averaged into two scores: one for the demographic section and one for the attitude scale section. For the physician questionnaire, the scale's mean CVIs were .95 for demographic and .93 for attitude items (SD=0.10 and 0.10 respectively). The corresponding midwifery indices were .92 for demographic and .90 for attitude items (SD=0.08 and 0.09 respectively). There was high concordance between the midwives' and physicians' I-CVIs for items that we retained. Individual items with content validity indices below .80 were deleted or retained only after substantial revisions to improve clarity and relevance based on experts' suggestions.

Qualitative comments provided by the expert panels, including suggestions for rewording, restructuring or omission of items according to their relevance were collated and reviewed. Special

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attention was given to items that elicited comments from multiple experts. Several questions that highlight differences between provider groups caused consternation in the panel, with concern about accurately reflecting the experience of each provider group. For example, many physician panel members indicated that questions pertaining directly to home birth practice would not be relevant to their groups. Given how fundamental these questions were to our study objectives, the questions were nonetheless retained. To address

the experts' concerns, we added an explanatory section to the cover page, with information about the importance of asking identical questions to providers with different educational experiences and scopes of practice.

Another area of concern for expert panel members related to the nature of the attitude scale questions. Some attitude items are intentionally worded as provocative statements, intended to elicit quick, reactionary responses, and are therefore often perceived as 'biased'. The attitude scale contains an identical number of 'pro' and 'anti' home birth items. Maintaining this balance ensures that the entire scale does not favour one perspective. Nonetheless, expert panelists sometimes reacted strongly to the implied attitude, rejecting the concept that their own provider group would reliably agree or disagree with the item. Items that elicited particular concern about this type of bias were carefully reviewed to ensure clarity, and were then retained. For example, the attitude statement "Planned home birth is more empowering for the mother than hospital birth" elicited this response, yet was retained in the final questionnaire: "What...no woman can have an empowering birth in the hospital?????"

#### *Assembling the Questionnaire*

Once the selection of items was finalized, the investigators considered the impact of presentation and sequence. The order of the attitude scale items



was randomized to avoid clusters of questions that appeared favourable or unfavourable towards planned home birth. Attitude items that were reworded to ensure an equal number of positive and negative statements were scrutinized by the research team to verify that there had been no change in underlying meaning.

Questionnaires were translated into French by a professional translator. To ensure that the language used was consistent with the vernacular of maternity care professionals, translations were carefully reviewed, and revised as necessary, by a French-speaking, bilingual midwife and a bilingual psychometrician, and questions were sent for re-translation until consensus on meaning was achieved.

#### *Branding*

The research team decided to title and 'brand' the study, in order to increase recognition and participation. The team wanted to ensure that all public messaging about the project clearly communicated the focus of the study without alienating potential respondents because of the controversial nature of home birth. The team discussed several study names, and agreed on "The Canadian Birth Place Study", as clear, professional, and honest about the subject matter, without using the highly polarized phrase "home birth", which could potentially dissuade a potential respondent from participating without further review. A graphic designer was contracted to design a logo and printed recruitment materials.

#### *Web Development*

The questionnaire was made available in two forms: electronic (web-based) and paper. The research team contracted a web developer to build and host a website for the electronic version, with the domain name 'birthplacestudy.ca'. Both questionnaire versions were available in English and French and contained identical sequencing, wording, and sections. Informed consent forms were available as

linked pdfs from the study home page.

#### *Pilot Testing*

The English version of the questionnaire was pilot tested with senior trainees at the University of British Columbia from each provider group (midwifery clerks from the Midwifery Program and Family Practice and Obstetrics/Gynecology residents). Trainees were encouraged to complete the questionnaires, to track time required to complete, and to add qualitative comments on any questions that they felt were ambiguous or problematic. As a result of the pilot study, several small changes were made to demographic response options. For example, some questions had been missing 'don't know' or 'not applicable' response

options. The pilot test also called attention to problems with logical branching of questionnaire items (built-in logic that directs participants to appropriate questions based on previous responses).

#### *Sampling Methods*

To obtain the most representative sample possible, we chose to survey all practicing Canadian registered midwives (N=759), obstetricians who provide intrapartum care (N=800), and a random sample of 3,000 practicing family physicians (out of approximately 30,000 total),

including those who do and do not provide intrapartum care. We obtained contact information for midwives through provincial midwifery colleges' websites. Physicians' addresses and contact information were obtained via the 2009 Canadian Medical Directory on CD-ROM from Scott's Directories.<sup>24</sup> We used province/territory-stratified random sampling to select the family physicians sample. Approximately 37% of fax numbers were missing from the Canadian Medical Directory for family physicians and obstetricians. A research assistant filled in missing contact information by searching the websites of provincial colleges of physicians and surgeons, by searching online, and, as

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a last resort by phoning practices to request fax numbers or mailing addresses. Email addresses were available for the majority of midwifery practices and approximately 20% of physicians.

#### Questionnaire Administration:

Healthcare providers are notoriously difficult to recruit for participation in survey based health services research, particularly those in private practice or community-based settings.<sup>25-29</sup> The validity of any survey study relies heavily on an adequate response rate. Therefore, the research team reviewed survey methodology literature about increasing response rates to inform survey instrument administration and participant recruitment strategies.

Evidence from a recent systematic review<sup>25</sup> suggests that perceived salience, clarity, and value of a survey topic determine physicians' willingness to participate. Specific elements of survey design and incentives for participation can significantly increase response rates.<sup>25</sup> Monetary incentives, even as small as \$1, most significantly increase response rates by physicians,<sup>30, 31</sup> and other healthcare providers.<sup>32, 33</sup>

Pre-notification letters introducing the study,<sup>34, 35</sup> attractive, business letter-like questionnaires,<sup>25, 36</sup> personalized cover letters,<sup>37-39</sup> closed-ended questions,<sup>40</sup> and endorsement by opinion leaders or professional associations,<sup>26, 41</sup> can all significantly increase response rates.<sup>25</sup> As well, employing multiple methods of approaching participants over a long recruitment period has been shown to increase response rates.<sup>42, 43</sup>

All of these strategies were incorporated into our questionnaire administration plan. After ethics approval was received from the University of British Columbia Behavioural Ethics Board (number H09-00381), questionnaire administration began. A multiple contact strategy was used to advertise to selected participants, following a modified Dillman method<sup>44</sup> with up to 3 reminders at 2-3 weekly intervals. The initial contact for all participants was via mail with a pre-notification post-card. At 2 and 6 weeks after the initial mailing, the Canadian Association of Midwives and the Society of Obstetricians and Gynecologists of Canada emailed a study invitation to their members who agreed to receive online surveys. Next, personalized faxes

Figure 1.  
Timeline of  
recruitment  
methods and  
surveys started.

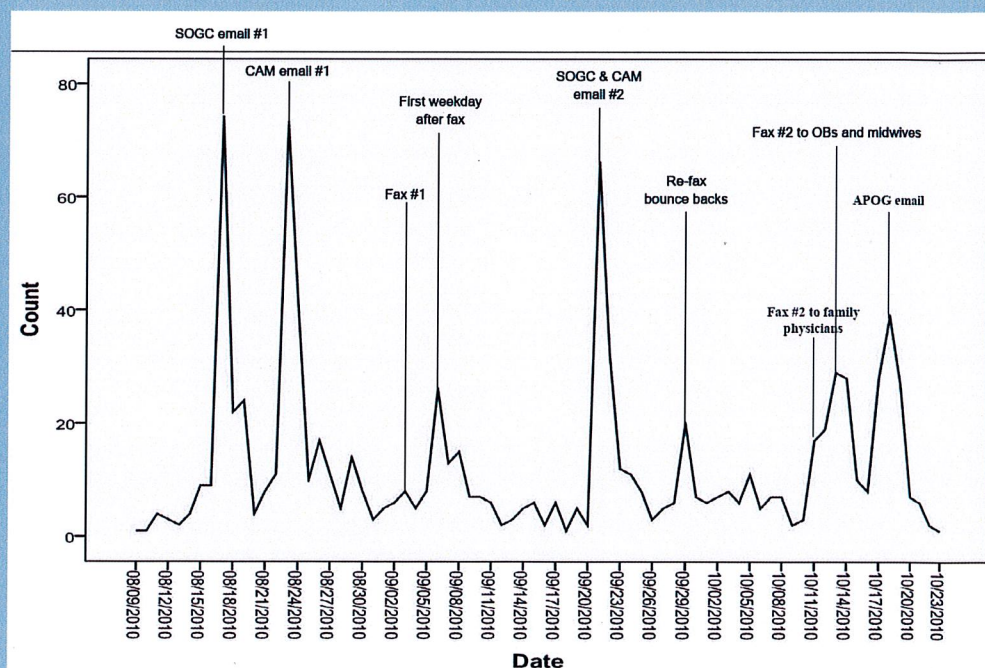
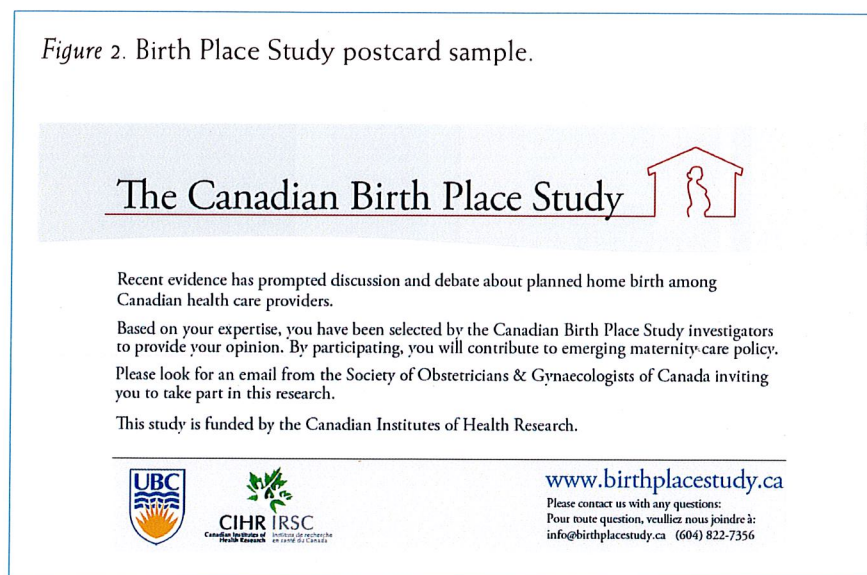




Figure 2. Birth Place Study postcard sample.



were sent to individual practice offices. Subsequent recruitment notices were distributed in sequence: fax, email, fax, email. The goal was to contact participants using multiple media, but to direct them to the website with each contact. See Figure 1 for a timeline of the contact strategy and questionnaires started.

In order to communicate the salience and value of the topic, the research team wrote invitations to potential respondents carefully, and tailored the language to communicate relevance to each provider group. A covering letter signed by the principal investigator and/or representative of the appropriate healthcare provider association explained the purpose and the voluntary and confidential nature of the study. The research team offered a \$1 contribution to a choice of four charitable organizations for each completed questionnaire.

The study title, logos from funders and endorsing organizations, the professional "look", and style of message remained consistent across postcards, emails, and faxes. The specific recruitment language was modified for each provider group to maximize response rates. For example, we began by crafting language which focused on respondents' ability to influence maternity care policy and curriculum development. Later, we reported the response rate

to date of their own group as well as another provider group in hopes of motivating providers to ensure robust representation from their own profession's perspective. See Figure 2 for an image of the postcard.

#### *Survey Development in a Multi-disciplinary Context*

The detailed content validation process undertaken for this study proved to be essential to improving both interpretation and applicability of collected data within the Canadian context. Our strategy of recruiting two distinct

profession-specific expert panels with experience from diverse practice environments ensured that evaluation of relevance and clarity was specific to each study population. The construction of two different versions of the questionnaire with identical or parallel wording will allow us to report on comparisons across maternity professional disciplines, to describe provider-specific characteristics of attitude development, and to understand how the samples are alike or different.

#### *Questionnaire Administration*

The questionnaire was administered electronically, which is preferable for a number of reasons. Electronic entry eliminates potential data entry errors, enhances data quality by requiring respondents to answer all questions and preventing ambiguous written responses, and allows for logical question elimination, thus reducing the total number of questions required for on-line study participation. In addition, online hosting avoids printing and mailing expenses.

Our results suggest that a multiple method invitation strategy (postcard, email, fax) that adheres to the survey methodologies outlined in VanGeest et al's<sup>25</sup> systematic review is effective with Canadian obstetricians and midwives. While the multiple contact strategy relies on increasing familiarity with



each contact, we noted the most dramatic spike in participation following email invitations from professional associations. This is consistent with Bhandari's<sup>41</sup> and Asch's<sup>45</sup> findings. Faxing individual practices appears to be an efficient contact strategy. Recruitment slowed down towards the end of the two month recruitment period, suggesting that this length was sufficient.

#### *Challenges of studying a multi-disciplinary population*

There are particular challenges to questionnaire construction for a multi-disciplinary population, especially in obstetrics. Unlike other areas of medicine, there appears to be more polarization around obstetric management options. For example, when considering therapeutic plans for cardiac rehabilitation, nurse-practitioners, physicians, dieticians, and physiotherapists may all collaborate to create a unified treatment plan, and healthcare consumers commonly follow expert consensus; but in maternity care, there exists more divergence in consumer expressed preferences for care options, and, when those options are endorsed or discouraged by providers who disagree, the impact of provider attitudes and opinions may be greater. This is further complicated when what consumers want and what the evidence suggests is not consistent or well understood. Our approach to developing a survey on a controversial subject in a multi-disciplinary context is likely generalizable to similarly controversial topics in other areas. Convening both a research team and expert review panels that represent the study populations (e.g. not solely content experts on home birth), and attending to item generation that provides for, and respects, the balance and a diversity of perspectives is essential to studying attitudes and experiences of healthcare providers. However, our study also elucidated some of the unique challenges of studying such a contentious and politicized topic. We realized that every step of item generation, questionnaire construction, and recruitment should acknowledge controversy, and account for differences in professional cultures, education, and practice environments that may relate to attitude differences. Capitalizing on common biases held by

each profession during recruitment can enhance participation.

The goal of following rigorous methods for content validation, questionnaire development, and sampling plans is to reduce bias and to enhance both internal and external validity of the results. This means asking the right questions, in the right way, to enough of the right people. When the research topic itself elicits bias and strong differing opinions in the study population, the right questions may need to be tailored to audience, region, and provider group. As well, accurately characterizing the variety of conditions that affect attitude development may be more important than having a large sample in a single context. In our previous work with nurse-midwives in the US, attitudes were shaped by exposure to home birth during their education, exposure to home birth during practice, peer opinion, and/or the regional practice and regulatory contexts.

In the Birth Place study, items were also designed to elicit **core beliefs** about home birth (attitude items), perceived and actual external barriers to planned home birth practice, and correlates of attitudes, including socio-demographics factors and preparation for and exposure to home birth practice. By including potential factors in attitude development that were relevant to both midwives and physicians (such as educational and professional exposure to home birth), allowing for both positive and negative responses to the same concept, and choosing wording that reflected each profession's culture and reality, we were more likely to elicit both differences and similarities between individual respondents and/or provider groups. All relevant subdomains of attitudes were represented in the attitudinal section, including items about safety/outcomes, maternal/newborn care procedures, the maternal/newborn experience, logistic/financial/legal issues, and the provider's own engagement in home birth practice. How respondents react to the whole set of attitude items, with an even balance 'pro' and 'anti' home birth, should describe the context of their core beliefs.



Preventing alienation of any one group, while retaining the ability to compare individual and aggregated items across all groups with such different experiences, was a significant challenge. We needed to ask everyone the same questions, though some questions would not be relevant to one group's context. For example, we had to ask all providers if they attend home births, knowing that the vast majority of physicians do not. Similarly, we asked participants to identify their gender, knowing that all Canadian midwives are female. We were able to make some minor compromises to enhance relevance and participation (such as using the term "patient" for physicians, and "client" for midwives), without compromising comparability. We also attempted to reduce respondent frustration by introducing each section with a statement that even those questions that may not seem relevant are important, and offering an optional comments box.

Throughout the data collection period the study team received email and fax communications which revealed widely disparate reactions to the topic, and reasons for participation or non-participation. We received messages from physicians asking to be excluded due to no intrapartum practice, perceived bias in the wording of the questionnaire, or anger that the topic was being studied at all. However, simultaneously, communications were sent by both physicians and midwives thanking us for the opportunity to participate, praising the range of questions, and asking to be kept informed of results.

Planned home birth in North America is uncommon, but both consumers of maternity care and healthcare economists are increasingly interested in this option. Professionals from many disciplines interact with choice and outcomes: home birth providers (RMs), physicians, nurses, educators, liability specialists and hospital administrators. Ultimately, being able to describe how education, practice, and personal demographics are the same and/or different will illuminate how those factors interact with ideas and opinions about planned home birth. Utilizing rigorous questionnaire construction and validation methods will allow us to explore and describe data

that are comparable across professional groups and will inform in-depth exploration through the subsequent focus group and key informant phase of the study.

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