

Mode of delivery affected questionnaire response rates in a birth cohort study

Isabelle Bray^{a,*}, Sian Noble^b, Ross Robinson^c, Lynn Molloy^c, Kate Tilling^b

^aDepartment of Health and Social Science, University of the West of England, Frenchay Campus, Bristol BS16 1QY, England

^bSchool of Social and Community Medicine, University of Bristol, Canynge Hall, 39 Whatley Road, Bristol BS8 2PS, England

^cALSPAC, School of Social and Community Medicine, University of Bristol, Oakfield House, Oakfield Grove, Bristol BS8 2BN, England

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Abstract

Objectives: Cohort studies must collect data from their participants as economically as possible, while maintaining response rates. This randomized controlled trial investigated whether offering a choice of online or paper questionnaires resulted in improved response rates compared with offering online first.

Study Design and Setting: Eligible participants were young people in the Avon Longitudinal Study of Parents and Children (ALSPAC) study (born April 1, 1991, to December 31, 1992, in the Avon area). After exclusions, 8,795 participants were randomized. The “online first” group were invited to complete the questionnaire online. The “choice” group were also sent a paper questionnaire and offered a choice of completion method. The trial was embedded within routine data collection. The main outcome measure was the number of questionnaires returned. Data on costs were also collected.

Results: Those in the “online first” arm of the trial were less likely to return a questionnaire [adjusted odds ratio: 0.90; 95% confidence interval (CI): 0.82, 0.99]. The “choice” arm was more expensive (mean difference per participant £0.71; 95% CI: £0.65, £0.76). It cost an extra £47 to have one extra person to complete the questionnaire in the “choice” arm.

Conclusion: Offering a choice of completion methods (paper or online) for questionnaires in ALSPAC increased response rates but was more expensive than offering online first. © 2016 The Author(s). Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Keywords: Randomized controlled trial; Online questionnaire; Response rates; Cohort study; ALSPAC; Mixed mode

1. Introduction

As the fields of lifecourse epidemiology and epigenetics develop, multigenerational birth cohort studies are becoming increasingly important to health and social research [1,2]. Initial response rates to population cohort studies have decreased over recent decades, and such studies experience declining participation rates throughout the lifetime of the study [3]. Selection and attrition bias therefore threaten the validity and viability of large cohort studies. Reasons for attrition are generally divided into (1) failure to locate (i.e., address changes), (2) failure to contact, and (3) refusal to participate. There is a considerable

literature around the best methods to keep up-to-date addresses for study participants, often referred to as “tracking” (e.g., [4–6]). Failure to contact is most relevant to studies which seek face-to-face contact for data collection (e.g., the UK Household Longitudinal Survey). Maximizing participation, whether that be participating in an interview, attending a clinic, or completing a questionnaire, is crucial to the success of any cohort study. The approach taken by individual cohort studies is usually based on shared experience of best practice [7], although randomized controlled trials (RCTs) are increasingly being used to assess methods to improve response rates in cohort studies, for example, Boyd et al. [8]. Booker et al. [9] carried out a systematic review of various retention methods used by population cohort studies and concluded that incentives boost retention, but that the other methods they assessed (e.g., reminders, alternative methods of data collection) had not been sufficiently evaluated. Only 11 (39%) of the 28 studies included in the review were RCTs of methods for cohort retention. This highlights the lack of evidence

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* Corresponding author. Tel.: +44 (0)117-3288923.

E-mail address: Issy.Bray@uwe.ac.uk (I. Bray).

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What is new?**Key findings**

- In this birth cohort study, offering a choice of online/paper questionnaire (concurrent mixed mode) resulted in higher response rates than offering online-only first (sequential mixed mode).

What this adds to what was known?

- Cohort studies administering questionnaires should weigh this benefit in terms of response rates against the increase in cost associated with offering a choice.

What is the implication and what should change now?

- This trial should be replicated in other cohorts of different ages, considering the effects in different demographic subgroups.

about which cohort retention methods are most effective. There is better evidence about measures to improve response rates to questionnaires [10]. For example, the use of incentives has been shown to improve response rates to electronic health surveys [11].

The Avon Longitudinal Study of Parents and Children (ALSPAC) is a birth cohort study which is following up children born in a 21-month period in 1991–1992. Questionnaire data in ALSPAC have traditionally been collected by postal questionnaires. For large cohort studies, particularly in times of austerity, online data collection is a financially attractive option [12]. It is also assumed to appeal to younger participants, whom have grown up in an electronic age and for whom mobile devices and social media are integral to their lives [13]. Although online methods have been used for some data collection exercises in ALSPAC, the reported response rates [14] suggest that participants are not ready to move to an online-only model, and the main questionnaires until 2012 were all administered on paper. But, like some other cohort studies, for example, Growing up Today (<http://www.gutsworld.org/>), ALSPAC is seeking to move its participants toward online questionnaire completion for a variety of reasons. The main drivers are presumed improved response rates and reduced costs. The online approach is also expected to speed up the process of questionnaire administration and data entry, improve data accuracy, and reduce environmental costs. The anticipated improvements from the participants' point of view include choice about how and when to complete the questionnaire (particularly as functionality on Smartphones improves) and instant and easy submission of data (reducing unwanted reminders and the need to find a postbox).

However, there are concerns about using an online-only approach for data collection. Evidence from both market

research [15] and health-related research [16,17] suggests that it will lead to lower response rates than traditional paper questionnaires. Furthermore, online data collection could exacerbate the bias toward more educated participants that typically arises through selection and attrition in cohort studies, as those with less access to the Internet might be discouraged from taking part [18,19]. In practice, however, online data collection in cohort studies is likely to be followed up with an option to complete a paper version (a sequential mixed-mode approach). The use of multiple methods of data collection in surveys has been debated [20] and may even reduce response rates [21] but is reported to have the potential to achieve similar response rates to those of traditional postal questionnaires [22]. There is ongoing discussion in the survey literature about the relative merits of concurrent and sequential mixed-mode approaches [23], with some authors suggesting that a sequential approach is superior [24]. At the same time, there is a paucity of evidence comparing concurrent and sequential mixed-mode approaches in population cohort studies administering lengthy questionnaires [19]. We have conducted a nested RCT comparing an “online first” (sequential mixed mode) arm with a “choice” (concurrent mixed mode) arm, in a routine follow-up of a birth cohort (aged 21 years at the time of the RCT). We compared the two approaches in terms of response rates, completion rates, and costs, including administrative time.

2. Methods*2.1. ALSPAC cohort*

ALSPAC recruited 14,541 pregnant women resident in Avon, UK, with expected dates of delivery April 1, 1991, to December 31, 1992; 14,541 is the initial number of pregnancies for which the mother enrolled in the ALSPAC study and had either returned at least one questionnaire or attended a “Children in Focus” clinic by July 19, 1999. Of these initial pregnancies, there was a total of 14,676 fetuses, resulting in 14,062 live births and 13,988 children who were alive at 1 year of age.

When the oldest children were approximately 7 years of age, an attempt was made to bolster the initial sample with eligible cases who had failed to join the study originally. As a result, when considering variables collected from the age of 7 years onward (and potentially abstracted from obstetric notes), there are data available for more than the 14,541 pregnancies mentioned above. Further phases of enrollment are described in more detail in the cohort profile [14].

The total sample size for analyses using any data collected after the age of 7 years is therefore 15,247 pregnancies, resulting in 15,458 fetuses. Of this total sample of 15,458 fetuses, 14,775 were live births and 14,701 were alive at 1 year of age. These children, now young people (YP) of around 24 years of age, and their parents (or step parents) have been followed in detail until the present

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