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Objective
To investigate a method of using patient-held records to collect contraception data in Malawi, that could be used to explore contraceptive discontinuation and method switching.

Methods
In 2012, all 7393 women aged 15 to 49 years living in the area covered by the Karonga demographic surveillance site were offered a family planning card, which was attached to the woman’s health passport – a patient-held medical record. Health-care providers were trained to use the cards to record details of contraception given to women. During the study, providers underwent refresher training sessions and received motivational text messages to improve data completeness. After one year, the family planning cards were collected for analysis.

Findings
Of the 7393 eligible women, 6861 (92.8%) received a family planning card and 4678 (63.3%) returned it after one year. Details of 87.3% (2725/3122) of contacts between health-care providers and the women had been recorded by health-care providers on either family planning cards or health passports. Lower-level health-care providers were more diligent at recording data on the family planning cards than higher-level providers.

Conclusion
The use of family planning cards was an effective way of recording details of contraception provided by family planning providers. The involvement of health-care providers was key to the success of this approach. Data collected in this way should prove helpful in producing accurate estimates of method switching and the continuity of contraceptive use by women.

Introduction
Access to contraceptive services is important, not only because of the direct effect on reproductive health, but also because contraceptive use may lead to indirect improvements in general health and socioeconomic outcomes. Contraceptive use is one of the key proximate determinants of reduced fertility, which is, in turn, associated with economic development indicators. In Malawi, there has been a remarkable increase in contraceptive use over the past two decades: 7% of married women reported using a modern contraceptive method in 1992 compared with 42% in 2010. Paradoxically, fertility remains high. In 2010, women in Malawi bore on average 5.7 children and many pregnancies were unintended or occurred sooner than desired. A reason for this paradox could be overreporting in cross-sectional surveys: a woman might report using contraception, even if in reality she has missed or delayed family planning appointments and has discontinued a short-term method. Contraceptive discontinuation and switching of methods are key factors because, as desired family size decreases and contraceptive use increases, the effectiveness and duration of contraception become increasingly important determinants of fertility, unintended pregnancies and induced abortions.

Data on contraceptive use come from a variety of sources, including routine health facility records, cross-sectional surveys and retrospective surveys. Demographic and health surveys now include a contraceptive calendar, which captures self-reported data on contraceptive use, pregnancy, childbirth, breastfeeding and pregnancy termination for each calendar month in the five years before the survey interview. Although calendar data do not suffer from the problem of loss-to-follow-up, there is a selection bias as only women who survive until the interview can report, and there are likely to be recall issues. One study from Bangladesh found poor consistency between reports given in a baseline interview and reports given in a follow-up survey in which women were asked to describe retrospectively their contraceptive use during the month covered by the baseline survey. Consistency was especially poor for women with complex reproductive histories. Single-country studies on contraceptive discontinuation and switching, based on data from sources other than demographic and health surveys, are uncommon because such data tend to be difficult to collect and analyse. Thus, most research has been based on cross-country comparative reports, which often used data from the calendar section of the demographic and health survey questionnaire. Using 2004 data from the Malawi Demographic and Health Survey, researchers found high contraceptive discontinuation rates in the country. Compared to 17 other developing countries, Malawi had the lowest proportion of women who switched to another modern contraception method within three months of method-related discontinuation, which suggests that switching behaviour (using another method) following discontinuation is poor. With the exception of the retrospective calendar, however, conventional assessments of contraceptive use are not able to capture switching or discontinuation. There is, therefore, a need for a prospective method for collecting more reliable data on contraceptive episodes.

In Malawi, a range of contraceptive methods are provided through different mechanisms (i.e. public or private through clinics or outreach) by various health-care providers: clinical officers, nurses, medical assistants, health surveillance assistants and volunteer community-based distribution agents. Women are expected to carry a health passport (a patient-held medical record) with them when they use health-care services. Some health passports – but not all – contain a dedicated family planning page on which health-care providers can record details of the contraceptive services provided.

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Abstracts in العربية, 中文, Français, Русский and Español at the end of each article.
The Karonga Prevention Study in northern rural Malawi operates a demographic surveillance site that covered 36,524 individuals at the end of 2012.20 Recent studies nested within the site have focused on adult human immunodeficiency virus (HIV) infection, sexual and reproductive behaviour and childbearing intentions.21–24 The contraceptive services in the study area are managed by the district family planning coordinator at the district health office. The demographic surveillance site provides an ideal setting for observational studies of contraception because the site has close links with health facilities and other providers of contraception and there is an opportunity to collaborate with the district family planning team. Also, new data on contraception use can be linked to the Karonga prevention study database, which holds current demographic and socioeconomic data on residents in the site. The database also provides information about, for example, childbearing intentions, marital history, parity and HIV status. Linking the data makes it possible to explore explanatory variables.

It has been suggested that patient-held medical records could play an important role in monitoring the continuity of health service use.25, 26 Here we investigated a method for using patient-held records – a so-called family planning card – to collect contraceptive data. This approach captures data recorded by providers and could form the basis of a prospective longitudinal data set. Such a data set would make it possible to study the continuity of contraceptive use and switching of methods and could serve to validate cross-sectional estimates of contraceptive use.

Methods

All women aged 15 to 49 years living in the area covered by the Karonga demographic surveillance site between January and April 2012 were eligible to participate in the family planning study. Consenting women were offered a family planning card. Subsequently, when a woman accessed family planning services, the health-care provider recorded details of her visit on the card. After one year, the family planning cards were collected by Karonga prevention study staff and data were linked to the database using unique, identifying information for each woman – and we analysed the data. Ethical approval was obtained from research and ethics committees at the London School of Hygiene & Tropical Medicine, United Kingdom of Great Britain and Northern Ireland and the College of Medicine, Malawi.

Before starting the study, approval was sought from the Wasambo Traditional Authority Chief, local village headmen and headwomen, the Karonga Area Development Committee and the Karonga District Health Management Team. Subsequently, the aims and data collection methods of this and two other studies were explained through 16 community sensitization activities involving local dance, song troupes and the study staff. These activities were undertaken to address potential misconceptions among the local community, to increase understanding of the nature of the study and, thereby, to improve the quality of the consent process and to answer any questions.

The area covered by the demographic surveillance site is split into 21 reporting groups, which are in turn divided into 278 clusters. Each cluster has a key informant who lives in one of the villages covered and has been trained by the study staff to use formatted registers for recording and subsequently notifying staff of vital events and individuals who have migrated.27 For our contraception study, the study staff trained the 278 key informants to distribute family planning cards between January and April 2012. Thirty separate training sessions were held, during which the key informants were trained to use listings of the approximately 25 to 40 women of reproductive age living in each cluster. Then, each woman on each list was visited by a key informant who explained the study and asked whether the family planning card, which was preprinted with information identifying the woman, could be stapled to the inside front page of the woman’s health passport. The list was updated to reflect whether or not the woman accepted the family planning card. The list was returned, along with any remaining family planning cards, to the study staff at a meeting held roughly 10 days after the initial training. Key informants received a small payment in recognition of their efforts. The educational level, skills and age of key informants varied. For those key informants who struggled with the task, a study staff member either visited them to assist or matched the key informant with another who had demonstrated competency so they could work together.
intrauterine device before receiving the family planning card, this was recorded as an explanation of why the card was blank.

At the time of data collection, each woman provided individual, informed, written consent for the data to be used in the analysis. Consent was not requested at the beginning of the study because the key informants were not members of the Karonga prevention study staff and could not administer the informed consent procedure. Women were compensated with a small payment for the time required to attend the data collection session. A small number of family planning cards were gathered after data collection had officially finished either as part of a three-month, opportunistic, mopping-up operation or whenever demographic surveillance site field staff encountered a woman who had not returned her card.

Statistical analysis

Data were managed and analysed using Stata version 12 (StataCorp. LP, College Station, United States of America). Differences in descriptive data between study participants and non-participants were evaluated using the \( \chi^2 \) test to determine if there was any selection bias.

Results

Details of study recruitment are presented in Fig. 1. In total, 6861 of the 7393 (92.8%) eligible women were issued with a family planning card. The proportion of women who received a card was highest in those older than 40 years (95.7%; 1071/1119) and lowest in those younger than 20 years (89.7%; 1480/1650). Most cards (95.7%; 6553/6841) were issued by key informants. The main reason for not issuing a card was that the woman could not be found (5.7%; 425 of eligible women) and actual refusals were infrequent (1.3%; 96). By the end of the one-year observation period, 2183 (31.8%) family planning cards had not been collected. The most common reasons were that the woman could not be found (13.6%; 932) or that the woman left the study area during the study period (11.3%; 775). In addition, 4.8% (332) lost their cards during follow-up and could not be included in the analysis. Although the majority of women returned their cards at prearranged collection meetings (4575/4653; 98.3%), a few gave their cards to the study staff at a later date. Overall, family planning cards were collected from 4678 women – 63.3% of all women eligible to participate in the study.

The socioeconomic characteristics and HIV status of all women eligible to participate in the study, of women who received a family planning card and of women who returned their family planning cards are described in Table 1. The characteristics of women who returned their family planning cards (i.e. study participants) were compared with those of women who either did not return their cards or did not receive a card to determine if there was any bias in recruitment.

To evaluate the study methods, we examined the information source for each contact between a health-care provider and a woman that concerned tubal ligation, a contraceptive implant, an intrauterine device, injectable contraceptives or oral contraceptive pills. In total, there were 3122 contacts and the source of most data was the information recorded by health-care providers on either the family planning card (78.3%; 2444) or the health passport (9.0%; 281; Table 2). Nevertheless, 12.7% (397) of provider–woman contacts were not recorded on a paper health record but were reported retrospectively by women during supplementary verbal interviews. Health surveillance assistants and volunteer community-based distribution agents were the most diligent at recording information on the family planning cards: 80.2% (1653) of contacts with a health surveillance assistant were recorded, as were 81.0% (277) of contacts with a community-based distribution agent. Clinical officers were least likely to record
contacts: only 58.3% (91) of contacts were recorded on family planning cards and only 9.0% (14) on health passports. Receipt of male or female condoms was predominantly reported verbally by the woman rather than recorded by the health-care provider on the family planning card or health passport. In Malawi, these items can be obtained from sources other than health-care providers.

### Discussion

Here we used an approach for collecting data on contraception based on patient-held records. Our experience may be useful to others who wish to conduct similar prospective research, particularly where there is a demographic surveillance site that can provide detailed and reliable data on the personal and family characteristics of potential users of family planning services. Our method employed several strategies for distributing and collecting family planning cards that enabled prospective data on contraceptive use to be gathered relatively quickly and economically from a very large number of women. With conventionally collected data on contraception, it is usually not possible either to track women over time or to link the services received from different facilities and providers. Findings using our approach will be presented in future research articles and will focus, in particular, on the continuity of contraceptive use by women and on providing more accurate estimates of contraceptive use that are not subject to underreporting. The observation that higher-level health-care providers were less diligent at recording data than lower-level providers is a phenomenon that has been reported elsewhere.

There was some evidence of selection bias, which was introduced during recruitment and due to factors associated with not returning the card. This has implications for the way contraception data should be interpreted: study participants were slightly older and more likely to be married than non-participants and it is known that older, married women are more likely to be contraceptive users.

Most data were collected prospectively on family planning cards or health passports that were completed by health-care providers even though they were busy and had not been trained to carry out research. The fact that some data were not recorded on paper records at the time the contraceptive service was provided has general implications for...
providers were filled in by the study staff who interviewed women about their contraceptive encounters when they collected the family planning cards. The result was a more complete data set than can be achieved using conventional data collection methods.

Several lessons can be learnt from our experience with this approach to data collection. In Malawi, some new health passports include a section akin to the family planning card where the use of oral contraceptive pills or injectable contraceptives can be recorded. Service providers could be trained to fill in this section correctly, perhaps with the aid of techniques such as reminder text messages. Periodic sampling of these records would provide longitudinal data on contraceptive use that could be used to analyse switching and discontinuation. The marginal additional cost of collecting contraceptive data on top of existing demographic surveillance site costs was 2.33 United States dollars per card per year. Better use of the family planning section of health passports and periodic sampling could be achieved if their costs were incorporated into the cost of providing health passports and routine data collection.

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**Competing interests:** None declared.

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**Table 2. Information source for each contact between a health-care provider and a woman, Karonga family planning study, Malawi, 2012–2013**

| Health-care provider | Information source for each contact, No. (%) |
|----------------------|---------------------------------------------|
|                      | Family planning card | Health passport | Verbal report by woman | Total |
| Clinical officer     | 91 (58.3)           | 14 (9.0)        | 51 (32.7)             | 156 (100) |
| Medical assistant    | 31 (72.1)           | 7 (16.3)        | 5 (11.6)              | 43 (100) |
| Nurse                | 386 (75.0)          | 78 (15.1)       | 51 (9.9)              | 515 (100) |
| Health surveillance assistant | 1653 (80.2) | 177 (8.6)    | 230 (11.2)           | 2060 (100) |
| Community-based distribution agent | 277 (81.0) | 5 (1.5)    | 60 (17.5)            | 342 (100) |
| Youth community-based distribution agent | 6 (100)       | 0 (0)        | 0 (0)                | 6 (100) |
| Total                | 2444 (78.3)         | 281 (9.0)       | 397 (12.7)           | 3122 (100) |

Note: The contraceptive services provided included tubal ligation, contraceptive implants, intrauterine devices, injectable contraceptives and oral contraceptive pills.

**Methods**

the credibility of routine health data. Moreover, missing data make it difficult for health-care providers to offer a consistent service as they are unable to see details of previous contraceptive services provided to their patients. The use of existing patient-held records as the sole source of data on the continuity of contraceptive use, therefore, has limitations in the absence of strengthened systems for routine data collection. Fortunately, for the purposes of our study, gaps in the data recorded by health-care providers could be filled.
医疗记录内。医疗服务提供者接受了培训，使用该卡记录女性使用避孕药具的详细情况。在研究过程中，提供者接受了进修培训课，并且收到了激励的短信，以提高数据完整性。一年之后，收集计划生育卡进行分析。

结果在7393名符合条件的女性中，有6861（92.8%）名收到了计划生育卡，4678（63.3%）名在一年后返还了计划生育卡。医疗服务提供者在计划生育卡或医疗手册上记录了医疗服务提供者与87.3%（2725/3122）女性之间的联系详情。低级别的医疗服务提供者比高级别的更加勤于在计划生育卡上记录数据。

结论计划生育卡的使用是记录计划生育提供者所提供避孕详情的一种有效方法。医疗服务提供者的参与是该方法成功的关键。用这种方法收集的数据对准确评估方法转换和女性使用避孕药的持续性颇有助益。
Se enseñó a los profesionales sanitarios a hacer uso de las historias para documentar detalles sobre los anticonceptivos administrados a las mujeres. A lo largo del estudio, los profesionales se sometieron a sesiones formativas de actualización y recibieron mensajes de texto motivacionales para mejorar el cumplimiento total de los datos. Después de un año, se recogieron las cartillas de planificación familiar para analizarlas.

**Resultados**

De las 3.793 mujeres que cumplían los requisitos, 6.861 (92,8%) recibieron una carta de planificación familiar y 4.678 (63,3%) la devolvieron al cabo de un año. Los detalles del 87,3% (2.725/3.122) de las visitas entre los profesionales sanitarios y las mujeres fueron documentados por los primeros en las cartillas de planificación familiar o bien en los pasaportes sanitarios. Los proveedores de atención sanitaria de bajo rango fueron más minuciosos a la hora de documentar los datos en las cartillas de planificación familiar que los de alto rango.

**Conclusión**

El uso de las cartillas de planificación familiar fue una forma efectiva de registrar los detalles de los anticonceptivos administrados por los proveedores de planificación familiar. La implicación de los proveedores de atención sanitaria fue clave para el éxito de este enfoque. La información recopilada de esta forma deberá ser de ayuda a la hora de producir estimaciones rigurosas sobre si existen cambios de métodos y continuidad en el uso de anticonceptivos por parte de las mujeres.

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