ウイは例外であろうが、保護者が適当にうまく学校を活用しており、小学校を中途退学しても、中等学校へ進学可能だという（第8章）。

小学校を卒業しただけでは、現金収入を安定的に得られる就職は難しい。多くの保護者がその現実を認識しており、したがって小学校での活動が受験対策中心にもなっている。ケニアのスラムに住む人々もそれを十分わかっており、中等学校進学の機会を模索しているが、多くの場合、経済的な理由により、断念せざるを得ない（第6章）。そして、貧困から抜け出せる唯一ともいえる可能性が閉ざされてしまう。

2-6. 生活言語と教授言語の相違

普段の生活で使用する言語と学校での言語が違うのは、アフリカ諸国では珍しいことではない。生活言語と初等教育の教授言語が大多数の子どもにとって同じなのは、タンザニアやエチオピアの一部であろう。多数（あるいは有力）民族の言語が「国語」になると、言葉だけではなく、一民族の文化や慣習が国のものになる。例えば、ボツワナの「ツワナ化」がそうである（第3章）。また、南スーダンはスーダンからの分離独立を果たし、それまでアラビア語が公用語（かつ教授言語）であったものが英語に変わることになった（第1章）。高等教育を受けた教師が、現在の公用語である英語をうまく話せないのである。話せる教師は、内戦中にウガンダなどの英語圏に逃れ、そこの難民キャンプなどで教育を受けてきた者である。現地のホテルやレストランで働くためには英語ができることが前提であり、ウガンダ人やケニア人が雇用されているケースが非常に多い。

2-7. 紛争がもたらす負の遺産

最後に、非常に大きな、重い課題である。平和がなければ、教育もない。そのために平和教育を推進しようとする向きもあるが、そんなに簡単なことでもないことは、誰しもが理解している。南スーダンは紛争の影響を最も受けてきた国である（第1章）。正確に言えば、まだ紛争は終結していない。学校教育を受ける機会がなかった成人がたくさんいる。父母を失った子どもも多い。道路や橋であれば、外部からの支援で改修することはそう難しいことではない。ただ、教育は話が違う。トルコへ逃れたシリア難民によれば「教育を国民に提供できないのは、時限爆弾を抱えるようなものだ」と言う。いつ国が破滅するかわからない、ということだろう。モザンビークも20年近く、内戦状態であった（第4章）。内戦終結から、20年が経過した現在も、学校施設の不足は解消されず、大規模クラス、二部制・三部制での授業が行われている。南アフリカは「紛争」ではないが、アパルトヘイトにより、適正な教育の機会を奪われた人々がほとんどであり、この負の遺産は今も重くのしかかっている（第11章）。

フィールドと長期にわたり関わることは、私自身の反省も含めて言えば、さまざまな教育的な事象をより公正に解釈するために必要な過程でもある。調査をさせてもらってデータを取るというより、関係の方々からの学びの連続とも言えるかもしれない。次節では、最近のケニアにおけるそのような経験を2つ紹介したい。

3. ケニアでのフィールド調査から

3-1. 伝統的社会における小学校就学の意味―マサイ女性の生活から

(1) ジョイスとの出会い

ジョイス（仮名）と初めて会ったのは、2000年のことである。その時点では、小学校6年に在籍していたが、妊娠していることが判明し、欠席がちになり、2001年3月、子どもの出産を契機に7年生（17歳）で中途退学している。マサイの女子生徒の一人であり、1984年にO小学校近くのマニアッタ（伝統的家屋）で生まれている。中途退学はしているが、6年間の小学校生活は、現在の彼女の生活に反映されている。伝統的なマサイのコミュニティでは、女性の社会的地位が男性より著しく低く、家庭の中でも同様である。しかし、彼女の場合、夫とも対等に話をし、就学経験のない同世代の母親とは、その生活ぶりが明らかに違った。

このような経験を基礎としながら、生徒にとっての就学の理由や意味として、知識の習得や中等学校への進学以外に、友人関係の形成など、非認知的な役割が小学校にあることがこれまでに明らかになった（澤村・伊元2009；伊藤・澤村2011；十田・澤村2013）。ジョイスをめぐる2010年および2011年に行った就学経験の効果を検証した調査では、①社会的ネットワー

写真1　家族と共に幸せそうに生活するジョイス

クの拡大、②公用語の習得、③衛生と健康の改善、④対等な夫婦関係の構築、⑤計画力の獲得、⑥ソフトスキルの向上においてその影響が確認された（澤村 2012a, 2012b）。そして、小学校就学は伝統的コミュニティにおける生活の質を高めることに寄与していることがわかってきた（写真1）。

これまではジョイス一人だけの情報に依存して就学の効果を解釈してきたが、もう少しサンプル数を増やすことは必要不可欠である。また、マサイ女性だけからの聞き取りでは、意識されていない就学の影響も想定され、十分に掘り起こせていない効果があることも予想されるので、教師にも同時に聞き取りを行った。学校教育の長期的な効果が、個々人の生活の中でどのように生かされているのだろうか。

(2)　調査対象のマサイ女性の属性

調査の基点としているO小学校およびその周辺地域は、ナイロビから車で1時間半程度、約100kmの距離にある。2000年の時点では、生徒数400人程度の中規模の学校であったが、近隣の街の店舗数や人口も大幅に増え、寮を完備し、交通の便も比較的良いことから、2014年には生徒数

写真2　就学経験に関するインタビュー調査

表1　調査対象マサイ女性の属性

仮名	生年（年齢）	小学校卒業年	結婚年（年齢）	夫の学歴（年齢）	子どもの数
A	1969年（43歳）	1985年	1988年（19歳）	不就学（55歳）	1男1女
B	1984年（28歳）	2000年	2003年（19歳）	教員養成校卒業(42歳)	2男2女
C	1988年（24歳）	2006年（7年中退）	2006年（18歳）	中等学校卒業（34歳）	3男2女
D	1978年（34歳）	1995年	1996年（18歳）第二夫人	不就学（60歳）	4男2女
E	1989年（23歳）	2005年	2008年（19歳）	小学校卒業（32歳）	2女
F	1978年（34歳）	1995年（7年中退）	1995年（17歳）	小学校5年（40歳）	3男4女

820人の大規模校になっている。このO小学校の近隣に住むマサイ女性に対して、2012年9月にインタビュー調査を実施した（写真2）。

質問内容は、意図的にあまり構造化せず、自然な会話の中から、就学・不就学の違いを聞き取るようにした。対象者は就学経験のあるマサイ女性6人である（表1）。補足的に、教師14人および地区の教育行政官1人にも聞き取りを行った。マサイ女性の年齢は20歳代前半から40歳代までの広がりがあり、いずれも20歳前に結婚し、小学校卒業（あるいは中退）後、7～27年が経過している。

(3)　マサイ女性から見た就学の価値

マサイ女性から見た就学の効果（自身と不就学女性との日常生活における違い）は、次の①～⑰のとおりである。括弧内のアルファベットは、具体的に各項目に関連する発言のあった女性の仮名（表1）に対応しているが、項目別のリストを作成し確認する手法は意図的にとっていないため、発言のない女性がその項目に対して否定的な見解を示しているわけではない。あくまで自然な会話の中に当該項目が含まれていたか否かを示している。

教師に別に行ったインタビュー結果から想定された項目が多いが、その中で興味深い違いとして、マサイ女性へのインタビュー結果にだけ含まれる点は、①スワヒリ語が流暢に使える、②英語ができる、③自由に交通機関を利用して移動できる、⑧計算ができる、⑫友人がたくさんいる、である。女性自身にとっては、公用語としての英語や生活上必要になるスワヒリ語を習得できることが③の行動にもつながっている。また、⑫の友人がたくさんいると意識している理由は、学校での級友の存在も大きいが、少し変わった形での言語の問題とも関係している。マサイ女性Cを除いて、

全員が携帯電話を所有しており、テキストメッセージを送信し、相手の電話番号を登録するためには、スワヒリ語などの文字を理解していなければ使いこなせないのである。

① スワヒリ語が流暢に使える（A、B、C）
② 英語ができる（A、D）
③ 自由に交通機関を利用して移動できる（A）
④ 料理がうまくでき、栄養バランスに気をつかう（A、B）
⑤ 衛生的な生活を送ることができ、家の掃除をする（A、B、C、F）
⑥ 子どもの健康に気を付けた世話ができる（B、C、D、E、F）
⑦ 読み書きができ、メモが作れる（A、B、D、F）
⑧ 計算ができる（D、F）
⑨ 小規模なビジネスや農産物や家畜の売買ができる（A、C、D、E、F）
⑩ 独立した行動ができ、夫に依存しない（A、F）
⑪ 家計を任され、予算が立てられる（B、C、D、E）
⑫ 友人がたくさんいる（B、C、E）
⑬ 子どもの数は少なくてよい、これ以上いらない（B、C）
⑭ 知らない人とでも会話ができる（B、C、E、F）
⑮ 子どもが病気になれば、病院へ連れて行ける（B）
⑯ 家畜を消毒したり、薬を与えたりできる（C）
⑰ 夫と対等に会話ができる（C、F）

(4) 学校教育の長期的な効果

女子生徒の多くは、学校教育を伝統的な社会から抜け出す手段と認識している。確かに、都市への志向が強くなることは否めない。しかし、仮に伝統社会に残っても、彼女らの生活を調べると、確かな学校教育の効果が残っている。そのような伝統的な生活世界における近代的学校教育の葛藤について、内海（2003）は「短かったとはいえ、学校教育はジョイスの新しい生活に必要であり、これからの彼女の世界を支えるものではないかと思えるようになった」（78頁）と振り返っている。

このような違いが現れる理由として、頻繁に共通して使われる単語は、エクスポージャー（exposure）とインタラクション（interaction）の２つである。前者は新しい世界（新しい知識や考え方、場所）へのエクスポージャーであり、後者は生徒や教師、友人などとのインタラクションを通して、学びが生じるということである。換言すれば、前者は教科内容などから得られるものであるし、後者は学校という集団生活の場で自然に起こり価値意識にも影響を与える。

中途退学は好ましいことではなく、何よりも教育を受けることを断念せざるを得ないことを残念に思っているのは本人である。しかし、一定の期間、就学した経験を持つことは、彼女たちのその後の長い人生に確かな影響をもたらしている。初等教育は、単に教科の知識を学ぶだけではない。小学校では将来にわたって有効な知的財産と人間関係などのソーシャル・キャピタルを得ることができるのである。

3-2. 貧困家庭からみた学校教育の価値―スラムに住む家族の生活から

(1) ローズの生活と経歴

ローズ（仮名）とは、ナイロビ市内南西部にあるキベラ（東・南部アフリ

写真３　干し魚を路上で売るローズ

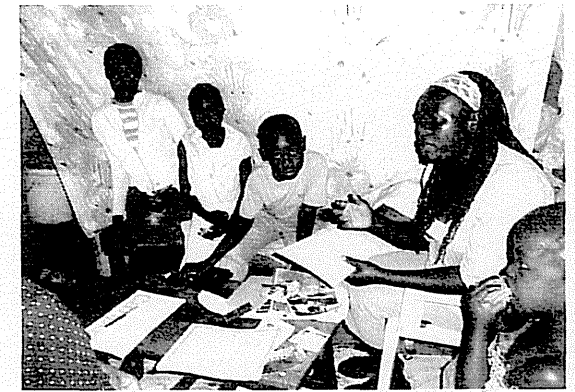

写真４　インタビューを受けるローズと子どもたち

カで最大規模のスラム）の大きな出入口付近で2010年10月に初めて出会った。彼女は路上で干し魚を小売りしていた（写真3）。中等学校2年まで修了しており、英語が達者である。干し魚をキスム（ビクトリア湖畔の都市）から大袋で運賃含め10,000シリングで仕入れ、それを小さな空き缶を使って20シリング単位で小売りしている（1ドル＝約90シリング）。この仕入れには携帯電話と人脈を駆使し、支払いにはエム・ペサ（ケニアで広く利用されている携帯電話を使った送金システム）を利用している。

彼女は1975年にシアヤ県（ニャンザ州）に生まれ、1982年に小学校入学、1990年に小学校を卒業している。驚くことに、兄弟姉妹9人は彼女（5番目）を除いて、すべて2～3歳未満で死亡している。1991年に中等学校に入学したが、2年生の2学期（5月）で授業料を負担してくれていた伯父が死亡し、退学せざるを得なかったという。そして、1994年に19歳で大工の夫と結婚した。出身地の周辺では仕事がなく、1995年から当時1歳の長女と共に家族でキベラに引っ越してきた。現在、6人の子どもを育てている。2009年に夫が急逝し、現在の路上販売を始め、朝9時から夜9時まで働いている。

(2)　家族構成と住居

ローズの子ども6人は、全員が就学している。しかし、第1子が入院し、医療費が必要になったことを契機に、経済的な負担を縮小するため、第2子と第3子は彼女の母親の妹がシアヤ県で養育するようになった。自宅はキベラのこの出入口から徒歩5分程度の便利な場所にある。20㎡程度の部屋を寝室と居間に間仕切りしている。床は土間のままで隣室との壁が傾き

表２　家計の月額収支概算

収　入	支　出
干し魚の小売り：9,000シル （2,250シル×4袋） 出産介助：4,200シル （700シル×6回） その他：800シル （乳幼児の世話、妊婦マッサージなど）	光熱水料：1,600シル （電気400シル、水200シル、炭1,000シル） 電話代：600シル 家賃：600シル 食費：6,000シル（最低でも） （砂糖220シル/2kg×4袋＝880シル） （ウガリ140シル/2kg×2袋＝280シル） （米220シル/2kg×4袋＝880シル） （豆250シル/2kg×4袋＝1,000シル） （肉〈週1回〉240シル/kg×4回＝980シル） （その他〈茶、野菜、油など〉：1,980シル） 教育費：3,200シル （第6子プレスクール500シル） （補習代3人分1,100シル） （図書費3人分300シル） （文房具代、制服代、靴代、受験対策補習料など1,300シル）
計14,000シル	計12,000シル

（注）ケニアの通貨「シル」は「シリング」の略。

危険な状態にあるが、内部は工夫してきれいにしている（写真4）。

第1子：1994年生まれ、小学校8年女
第2子：1995年生まれ、小学校8年女（別居）
第3子：1997年生まれ、小学校4年女（別居）
第4子：2000年生まれ、小学校4年女
第5子：2003年生まれ、小学校2年男
第6子：2005年生まれ、プレスクール女（2012年に小学校入学）

(3)　家計の収支

家計の収入は、母親ローズの労働だけに依存している。家計の収支は、概ね表2のとおりである。収支で余剰金が生じているように見えるが、これは収支ともに確定した数値が得られないことによるもので、決して生活にゆとりがあるわけではない。収入は干し魚の小売りと出産介助による報酬が中心である。これらを合算すると小学校教員と同程度の月収になる。干し魚は1袋あたり2,000～2,500シリングが利益になり、月4袋を売るという。出産介助の仕事は偶然にNGOによる研修を6ヶ月受講したことにより知識を得たが、地域住民からの信頼も厚い（新生児、産婦の死亡例がな

い)。週1～2回の介助があり、1回あたり1,000シリングを受け取る。剃刀やガーゼなどの必要経費を除き、700シリングの利益がある。妊婦にマッサージをすると30シリング／回になる。

この他に、例えば、1日乳幼児の面倒をみると500シリングが得られる。これはナイロビの労働者の日給が300シリング程度であることからすると高額である。これも中等学校までの学歴があるからこその仕事であり、ケニアの社会では、このような厳しい生活環境においても教育歴が有効になる。

医療費については、キベラの住民は居住を証明する特別なカードを持っていればキベラ内の診療所に行く限り無料になる（外部の病院の場合は有料）。それに比べると初等教育は「無償」であるが毎月、学校に支払う補習代（8年生の受験指導では1,000シリング／月を支払う）などの費用が必要になる。教育費用は月額として平準化しにくいが3,000シル程度は必要になるので、家計に占める割合は大きい。

(4) 家族にとっての学校教育の意味

3人の子どもはスラムに隣接する公立小学校に通っているが、教育の質は低く、できればキベラ内の私立校に通わせたいと考えている。ローズは子どもに教育を受けさせる理由として、「子どもの生活のため、母の生活のため」「明日のことがわからないから、子どもを中等学校へやる」と話している。生活が不安定で、将来が不安であるからこそ、教育に投資するわけである。

また、今のケニア社会では中等教育以上の学歴が必要だとも答えている。これは決して夢としての大学をめざしているのではなく、第1子が希望する美容師になる1年間の職業訓練コースに入るためにも、最低限必要な学歴だという現実的な理解である。その学費に年間75,000～80,000シリングが必要なことも知っている。ローズにとっては、中等学校2年までにしても、そこまでの学歴があるからこそ自分の就業の可能性が広がっていることを認識し、子どもにも最低限の教育を受けさせようとするのである。

4. 生活世界から学校教育を捉え直す意義

これまでの研究は、人々の生活と切り離し、教育だけを取り出して議論することが多かった。研究者がその場に身を置き、生活感を少しでも共有し、個々の文脈性を十分に理解できれば、これまでとは違った視角から教育のあり方を捉え直すことができるはずである。フィールドワークが驚きと学びの連続であるのは、研究者の理解不足もあろうが、対象も大きく変化しているためである（内海 2010）。子どもの視点から見た学校については、年齢の近い学生の分析内容や分析視角には興味深いものがある（伊藤・澤村 2011；澤村・倍賞 2012；十田・澤村 2013；野村・澤村 2013）。15年以上にわたり、毎年調査をしている同じ小学校においても、私が聞いたこともない、あるいは関心を持たなかった事柄について、独自の視点から貴重なインタビューデータを提供してくれた。

理想的には、今後、生活世界から学校を経て、教育政策へとつながる教育全体のミクロからマクロまでの全体像が明らかになれば、教育現場と教育政策の乖離の理由と背景も明確になる。本書の分筆者（吉田）の言葉を借りれば、「彼らの声を聞くことで、中央で議論されている教育の課題とそれに対する政策が、住民の生活とどのようなつながりがあるのかを確認することも可能となる」「政府の教育開発計画、事業計画書や統計資料などでは、ひとつひとつの問題が切り離されて取り上げられている」（第7章タンザニア）。

複数の調査者が複数の調査地でそれぞれの興味関心に沿って調査を行うと、自分以外の調査者の調査方法や物事の見方、考察の方法を知ることができ視野が広がる（澤村ほか 2010）。いわゆる研究に必要となる複眼的思考が、他の調査者の協力を得ながら可能になるわけである。関係の薄い事象だと思っていたことが、実はつながっていたなどの驚きが多く、そこからはより深い議論と考察に結びつく知的な刺激が得られる。また、他の調査者の異なった視点を参考にすることで、客観的に自分の研究を見つめ直すことができる。

本書の各章は、数年から十数年にわたるフィールドとの関わりのなかで生み出された研究成果である。それぞれの研究の視点に、研究者の個性や

人間性が表れるのも質的な調査の特徴かもしれない。フィールドワークの調査ツールは、研究者自身であることが、このような質的調査の醍醐味を物語っている。以下の各章において、研究者の立ち位置や見方の多様性を楽しんでいただければ、編者としてこれ以上うれしいことはない。

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第1部　変わる社会と学校教育

宣教団の下でサンの識字教育を担当していたサイモン。若くに脚を患った彼は、その歩き方から「カメ」と呼ばれていた。その名の通り様々な活動で着実な歩みを進め、優れたリーダーシップを発揮していたが、2009年に急逝した。（2008年、ナミビア・エコカ、高田明撮影）

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Effect of a maternal and child health handbook on maternal knowledge and behaviour: a community-based controlled trial in rural Cambodia

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Maternal and child health (MCH) handbooks are comprehensive home-based booklets designed to integrate MCH records. Although empirical evidence suggests the handbooks are more effective than current card-type records, this has not been scientifically demonstrated. The objectives of this study were to evaluate the impact of the MCH handbook on maternal knowledge and behaviour as measured by antenatal care (ANC) attendance, delivery with skilled birth attendants (SBAs) and delivery at a health facility. The Cambodian version of the MCH handbook was developed and introduced in two health centres, and two other health centres served as controls. Pre-intervention and post-intervention surveys were conducted with 320 women from the intervention areas and 320 women from the control areas who had given birth within 1 year before the survey. We evaluated the impact of the handbook by using difference-in-differences (DID) analysis and calculated adjusted odds ratios for pre–post changes in key indicators by using logistic regression. In addition, we interviewed multiparous women, health staff and health volunteers to assess the acceptance and cultural appropriateness of the handbook. Content analysis was performed with the English-translated transcriptions. The DID analyses revealed that all key indicators increased in the intervention group against counterfactual assumptions. The intervention also increased maternal knowledge of all topics addressed except for the risk of severe bleeding after delivery; this may be attributable to the influence of cultural belief. Logistic regression showed that the intervention increased ANC attendance, delivery with SBAs and delivery at a health facility, even after adjusting for maternal age, education and economic conditions. The qualitative data indicated that the handbook was well received and culturally appropriate. Thus, the MCH handbook is a reasonable and superior alternative to current card-type maternal records.

Keywords Antenatal care, difference-in-differences analysis, home-based record, maternal and child health (MCH) handbook, maternal outcome, skilled birth attendant

KEY MESSAGES

- This study was the first to examine the effectiveness of a maternal and child health (MCH) handbook in Cambodia. The results indicated that the MCH handbook positively influenced the promotion of antenatal care attendance, delivery with skilled birth attendants and delivery at a health facility.
- The MCH handbook was associated with increased healthcare knowledge in mothers.
- The qualitative data indicated that the handbook was well received and culturally appropriate.
- The MCH handbook is a reasonable and superior alternative to current card-type maternal records.

Introduction

Home-based health records are personal records of health data and information that are maintained by laypersons at home. Since the World Health Organization (WHO) first introduced a prototype of home-based maternal records (World Health Organization 1994), the effectiveness of such records has been evaluated and confirmed (Shah *et al.* 1993; Essen *et al.* 1994; Osterlund *et al.* 2005). Moreover, the WHO suggested that home-based maternal records would be an effective community-level tool for pregnancy and postpartum care (Gertler *et al.* 2011). The organization also recommended the distribution of birth and emergency cards for childbirth care, child health records and immunization cards for newborn care, and advocacy materials and counselling cards for infancy and childhood care (Gertler *et al.* 2011). Although each card and record has a specific and independent purpose, this system nevertheless results in multiple cards for each child, which can be confusing for mothers and health care providers. Although simple cards and thin books are easily produced, they are also easily misplaced.

Maternal and child health (MCH) handbooks are comprehensive home-based booklets intended to integrate all the previously described records into one book. MCH handbooks generally include records of antenatal care (ANC), labour and delivery, postpartum care, newborn and child care, immunizations and family planning. The handbooks also contain information for mothers on how to properly care for themselves and their children, including pictorial information for illiterate mothers. Thus, the handbooks contain MCH care records and information for the entire period between pregnancy and early childhood.

The effectiveness of MCH handbooks has been evaluated in developing countries in Asia (Isaranurag 2009; Gertler *et al.* 2011; Baequni and Nakamura 2012) and Africa (World Health Organization Regional Office for Africa 2012). Empirical results indicate that booklet-type records retain the advantages of card-type records, are welcomed by mothers and are feasible to implement, even in low-income countries. However, scientific evidence supporting the benefits of the handbooks is minimal. Using ecological data in Indonesia, Osaki *et al.* (2009) showed that the MCH handbook improved immunization coverage. Because the MCH handbook was provided as part of a provincial program in the intervention by Osaki *et al.*, all surveyed mothers should have received the handbook. Therefore, comparisons were made between mothers who retained the handbook and those who lost or failed to receive it due to program failure.

A recent study in the Palestinian Authority demonstrated that the MCH handbook improved maternal knowledge on exclusive breastfeeding and the risks associated with membrane rupture during pregnancy, especially among less-educated women (Hagiwara *et al.* 2013). However, because the handbook was rapidly accepted by many MCH centres, the size of the control groups was one-fourth that of the intervention groups, suggesting that those centres had some difficulties releasing the handbook. This study also lacked other comparable home record systems, consequently indicating the need for a study with a direct comparison between the handbook and other types of records.

Therefore, we conducted a quasi-experimental study of the effectiveness of the MCH handbook in Cambodia. There are several types of MCH-related home-based records in Cambodia, including the child growth card, the tetanus immunization card and the vitamin A intake record. The Mother Health Record is another record based on the WHO's prototype record (World Health Organization 1994) and serves as a substitute for hospital-based medical records for health professionals. Because this record contains only words and medical terms, many mothers (especially those with minimal education) do not understand what was recorded.

We developed a Cambodian version of the MCH handbook that comprised the records and information mentioned in the preceding text and introduced it in two health centre catchment areas. Two other health centres were assessed as controls. The objectives of this study were to evaluate the impact of the MCH handbook on maternal knowledge and behaviour and to investigate the acceptance and feasibility of the handbook.

Methods

Study area

This study was conducted in two districts in Kampong Cham Province, Cambodia: Ponhea-Krek-Dombae (PKD) and Memut. PKD has a population of 205 000, with 1 referral hospital and 16 health centres. Memut is situated east of PKD and has a population of 134 000; it has 1 referral hospital and 10 affiliated health centres. We purposely selected an intervention health centre and a control health centre in each district to ensure they were matched in terms of population, midwifery status (full-time vs part-time and secondary vs primary midwives), accessibility to main roads (especially during the rainy season) and performance of MCH activities (ANC, immunization and under-five clinic coverage).

Development of the MCH handbook

The Cambodian version of the MCH handbook was based on the Indonesian and Japanese handbooks. The cultural appropriateness of the handbook was assessed through feedback from physicians and nurses working for a local nongovernmental organization, individual interviews and focus groups with mothers, nurses and midwives. We revised the original version of the MCH handbook in accordance with this feedback to produce a trial version.

Training sessions on handbook use were conducted in the intervention areas for medical personnel (physicians, nurses and midwives), village health volunteers (VHVs) and traditional birth attendants (TBAs). The trial version of the MCH handbook was then introduced to the participating centres in January 2008. Mothers who received ANC at the intervention health centres and outreach programs in affiliated villages received the handbook and health education using the handbook. A researcher visited the health centres every month and monitored handbook use.

In the control areas, the standard Cambodian Child Health Card (child growth card) and Mother Health Record were used. As part of typical MCH services in Cambodia, all mothers in the control areas received these records as well as the tetanus immunization card and the vitamin A-intake record.

Study population

To evaluate the impact of the MCH handbook on maternal knowledge and behaviour, we conducted prospective pre-intervention and post-intervention surveys and compared the results between the intervention and control areas. Because the frequency of ANC visits among mothers in the studied areas was low (in our pre-intervention survey, 48.1% obtained ANC ≤ 2 times during pregnancy), we foresaw difficulties in conducting follow-up to evaluate the knowledge and behaviours of individual pregnant women. Therefore, we decided to evaluate the impact of the handbook on the community as a whole.

The subjects were women who had given birth 1 year before the survey. The number of women of reproductive age (15–49 years) living in the intervention and control areas was estimated based on the Cambodia Demographic and Health Survey (CDHS) (National Institute of Public Health *et al.* 2006) and the 2008 General Population Census (National Institute of Statistics 2009). Women of reproductive age comprised approximately one-fourth of the rural population (24.8% in the CDHS and 26.5% in the General Population Census), corresponding to 7,670 and 7,060 women in the intervention areas and control areas, respectively. The CDHS estimated the crude birth rate in the rural areas to be 2.6% of the population. However, this was found to be an underestimation when compared with the actual number of deliveries reported by monthly statistics at the health centres; thus, we estimated the crude birth rate to be 3.0%. As a result, there were 920 deliveries in the intervention areas and 847 deliveries in the control areas.

Sampling design

The sample was designed to provide representative estimates of health indicators in the intervention and control areas. We conducted two-stage cluster sampling: the first stage consisted of probability-proportionate-to-size sampling, and the second stage consisted of simple random sampling. Within each area (two areas for intervention and two areas for control), 16 clusters of households were selected with probability proportionate to size. Within each cluster, a systematic random sample of 10 households was drawn. A total of 160 women were selected from each area, resulting in 320 women from the intervention areas and 320 from the control areas. In case the survey team could not meet the designated woman, we paid another visit to the woman. If the woman was not available the second time, she was replaced by the nearest woman who met the criteria.

The sample size was calculated by using the following formula to estimate the prevalence of key indicators [i.e. ANC attendance and delivery with skilled birth attendants (SBAs) as 50%]:

$$n = \frac{Z_a^2 Xp(1-p)}{d^2},$$

n=required minimum sample size for simple/systematic random sampling.
Z_a=confidence level at 95% (1.96).
p=estimated prevalence of an indicator in the research area.
d=desired accuracy.

Both quantitative and qualitative data were collected to evaluate the intervention. The quantitative data were collected by using pre-intervention and post-intervention surveys. The key indicators for evaluation were maternal behaviours (i.e. ANC attendance, deliveries attended by SBAs and deliveries at health facilities). Additional indicators included maternal knowledge of danger signs during pregnancy and delivery, prevention of anaemia, prevention of intestinal parasites, mother-to-child human immunodeficiency virus (HIV) transmission, early breastfeeding practice and child immunization.

Interviewers were recruited from health professionals in Cambodia and trained by an author together with a Cambodian counterpart who had both a medical and an epidemiological background. The pre-intervention survey was conducted from June 2007 to July 2007, and the post-intervention survey was conducted from May 2009 to June 2009.

The qualitative aspect of the study assessed the cultural appropriateness of the MCH handbook and explored the potential obstacles and effects associated with its implementation. The subjects included multiparous women, midwives, nurses, VHVs and TBAs in the intervention areas. The inclusion criteria for subjects were as follows: (1) multiparous women who had used both the current records and the MCH handbook; (2) midwives and nurses in the intervention areas who had experience using both the current records and the MCH handbook and (3) VHVs and TBAs in the intervention areas who were trained to provide health education to mothers using the MCH handbook.

Twelve months after the MCH handbook was introduced, guided individual interviews were conducted with 20 multiparous women who had used both the standard Child Health Card/Mother Health Record and the MCH handbook,

8 midwives and nurses who worked at health centres and 10 VHVs and TBAs in the intervention areas. The interviews were recorded after obtaining oral consent from the participants. Women were selected from those living in villages near the health centres due to travel difficulties. For nurses and midwives, all of those who were working in the intervention areas were included. In the intervention areas, each village had appointed VHVs and TBAs who were assigned to collect information on deaths and births. They met regularly at health centres; therefore, participants were recruited at this regular meeting.

Data analysis

The survey data from the intervention and control areas were compared between pre-intervention and post-intervention using difference-in-differences (DID) analysis. DID analysis is commonly used to compare outcome changes over time between a treated population and a control population, which consequently assesses the impact of a given variable. This approach combines two comparisons, pre-and-post comparisons and comparisons between the intervention and control groups, to estimate the effect of interventions against counterfactual assumptions (Gertler *et al.* 2011).

We also calculated adjusted odds ratios (ORs) for pre–post changes in the four key indicators (ANC attendance at least once, ANC attendance four times or more, delivery with SBA and delivery at health facilities) in the intervention and control groups by using logistic regression. We examined the association between the key indicators and background variables. Those variables that showed a constant significant association in all groups with the four indicators were considered to be confounding factors and adjusted in the regression analysis; they were age, literacy and availability of electricity. IBM SPSS version 21 was used for statistical analysis.

The qualitative data were transcribed in Khmer and then translated into English. Content analysis was performed by using the English-translated data. The data were coded and classified into categories by comparing the differences and similarities between the codes.

Ethical approval was obtained from the author's institute and the Ministry of Health Cambodia.

Results

Sociodemographic characteristics

The sociodemographic characteristics of the respondents are summarized in Table 1. The intervention and control groups were similar in age distribution and marital status. Farming was the most common occupation among respondents and their husbands in both the intervention and control groups. A greater percentage of respondents and their husbands in the intervention groups worked part-time, relative to the control groups. In addition, many husbands of women in the control groups were merchants and office or factory workers.

The average number of years of schooling was significantly lower in the intervention groups than the control groups (one-way analysis of variance and Bonferroni test, $P < 0.05$). Literacy was also significantly lower among the pre-intervention groups than among the comparison groups. The change in literacy between the pre-intervention and post-intervention groups was greater for the intervention groups than for the control groups. Finally, asset ownership was significantly lower in the intervention groups than in the control groups.

Effect of the intervention

The DID analyses for key indicators are presented in Table 2. When the changes in the control groups were set as counterfactual assumptions, the results showed that all key indicators improved in the intervention groups. Moreover, the effect of the intervention on deliveries attended by SBAs was especially high.

The effect of the intervention on maternal knowledge of danger signs during pregnancy and delivery is indicated in Table 3. This information was presented in the MCH handbook with words or words and pictures. The intervention increased respondent knowledge of all subjects except for severe bleeding after birth. The effect of the intervention on knowledge of symptoms of placenta accreta was, although positive, less than one point.

Table 4 lists the effect of the intervention on knowledge and behaviour relating to anaemia, parasites, HIV infection, and early breastfeeding. In all four items, the intervention effect was positive and ranged from 6.2 to 9.9 points.

Logistic regression analysis

Because there were differences in literacy and economic conditions between the pre-intervention and post-intervention groups as well as the intervention and control groups, we performed logistic regression to calculate adjusted ORs by controlling for these confounders (Table 5). In intervention areas, the intervention significantly increased ANC attendance by four visits or more, delivery with SBAs and delivery at a health facility. In control areas, the only significant pre–post change was delivery at a health facility. Compared with the intervention areas (OR: 2.499, confidence interval: 1.746–3.578), the OR for delivery at a health facility was smaller in the control areas (OR: 1.866, confidence interval: 1.343–2.593).

Qualitative analysis

Qualitative data were collected from multiparous women, health centre nurses and midwives, VHVs and TBAs in the intervention areas. The sociodemographic characteristics of the participants are summarized in Table 6. The mean age of mothers in the intervention areas was 26.8 years (range: 21–33 years). All the participants were married. Sixteen were farmers, and the others were merchants, day workers and homemakers. Eight participants had no formal education, seven participants had received primary education and five participants had received secondary and higher education.

The mean age of health centre staff was 37.5 years (range: 25–53 years). Four were male, and four were female. Four were secondary nurses, three were primary midwives and one was a primary nurse. Three had >5 years of experience working at a health centre and five had >10 years of experience.

The mean age of VHVs and TBAs was 50.8 years (range: 29–56 years). Four were male, and six were female, all of them were farmers. Two had no formal education, two had received primary education, two had received secondary

Table 1 Sociodemographic characteristics of women in intervention and control areas

Sociodemographic Characteristics	Intervention				Control			
	Pre ($N=320$)		Post ($N=320$)		Pre ($N=320$)		Post ($N=320$)	
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Age (mean [SD])[a]	26.7	[6.25]	27.3	[6.47]	26.4	[5.93]	27.0	[6.07]
Marital status[b]								
Married	307	(95.9)	290	(90.6)	307	(95.9)	304	(95.0)
Other	13	(4.1)	30	(9.4)	13	(4.1)	16	(5.0)
Occupation of husband[c]								
Farmer	226	(70.6)	201	(62.8)	189	(59.1)	180	(56.3)
Occasional worker	36	(11.3)	71	(22.2)	28	(8.8)	49	(15.3)
Merchant	11	(3.4)	16	(5.0)	30	(9.4)	25	(7.8)
Office/factory worker	11	(3.4)	1	(0.3)	35	(10.9)	26	(8.1)
Other	36	(11.3)	31	(9.7)	38	(11.9)	40	(12.5)
Occupation of respondent[d]								
Farmer	207	(64.7)	143	(44.7)	181	(56.6)	130	(40.6)
Homemaker	40	(12.5)	104	(32.5)	75	(23.4)	131	(40.9)
Merchant	35	(10.9)	27	(8.4)	29	(9.1)	25	(7.8)
Occasional worker	31	(9.7)	38	(11.9)	12	(3.8)	11	(3.4)
Other	7	(2.2)	8	(2.5)	23	(7.2)	23	(7.2)
Years of school attendance[2b] (mean [SD])[a]	4.7	[2.63]	5.2	[2.44]	5.3	[2.57]	5.6	[2.47]
Literacy[b]								
Cannot read at all	180	(56.3)	100	(31.3)	139	(43.4)	144	(45.0)
Can read parts of/entire sentences	140	(43.8)	220	(68.7)	181	(56.6)	176	(55.0)
Household assets[b]								
Telephone	53	(16.6)	97	(30.3)	98	(30.6)	134	(41.9)
Motorbike	149	(46.6)	237	(74.1)	190	(59.4)	246	(76.9)
Television	124	(38.8)	131	(40.9)	151	(47.2)	167	(52.2)
Electricity	85	(26.6)	114	(35.6)	84	(26.3)	158	(49.4)

Note: SD, standard deviation.
[a]Analysis of variance.
[b]Chi-square test.
[c]Chi-square test between farmer and others.
[d]Chi-square test between farmer, homemaker and others.

Table 2 Effect of intervention on key indicators (DID)

Key indicators	Intervention (%)		Control (%)		Difference	Assumption[a]	Effect
	Pre ($N=320$) a	Post ($N=320$) b	Pre ($N=320$) c	Post ($N=320$) d	b − a	d − c	(b − a) − (d − c)
Frequency of ANC							
At least once	83.8	90.6	81.3	81.3	6.8	0.0	6.8
Four times or more	33.1	45.3	29.4	39.7	12.2	10.3	1.9
Delivery with SBA	53.8	77.2	56.6	67.8	23.4	11.2	12.2
Delivery at health facilities	51.3	74.1	34.1	52.5	22.8	18.4	4.4

[a]Counterfactual assumption.
$^{*}P < 0.05$.
$^{**}P < 0.01$.

education and four had completed high school. Two had <5 years of experience, four had between 5 and 9 years of experience and four had >10 years of experience as health volunteers.

All the mothers reported that they preferred the MCH handbook to the current record system. This opinion was shared by all of the health centre staff, VHVs and TBAs. The reasons why respondents preferred the MCH handbook were

Table 3 Effect of intervention on maternal knowledge of danger signs during pregnancy and delivery (DID)

Knowledge items	Intervention (%)		Control (%)		Difference	Assumption[a]	Effect
	Pre ($N=320$) a	Post ($N=320$) b	Pre ($N=320$) c	Post ($N=320$) d	b − a	d − c	(b − a) − (d − c)
Danger signs during pregnancy							
Swelling	16.6	48.1	24.7	43.8	31.5	19.1	12.4
Persistent vomiting	1.9	22.5	2.5	5.0	20.6	2.5	18.1
Severe headache or blurred vision	0.9	17.8	1.3	12.2	16.9	10.9	6.0
Convulsion	0.3	4.4	2.5	3.8	4.1	1.3	2.8
Bleeding from vagina	18.1	58.4	26.9	47.5	40.3	20.6	19.7
PROM	0.0	16.6	0.3	5.6	16.6	5.3	11.3
Danger signs during delivery							
Prolonged labour	9.4	30.3	16.9	31.9	20.9	15.0	5.9
Severe bleeding after birth	6.6	10.0	10.6	19.1	3.4	8.5	-5.1
Malpresentation	5.9	13.1	10.6	11.3	7.2	0.7	6.5
Placenta accreta	0.6	4.4	0.6	3.8	3.8	3.2	0.6
Convulsions	0.9	4.4	3.4	3.1	3.5	-0.3	3.8

Note: PROM, premature rupture of membrane.
[a]Counterfactual assumption.

Table 4 Effect of intervention on maternal knowledge and behaviour on anaemia, parasites, MTCT of HIV and early breastfeeding (DID)

Knowledge items	Intervention (%)		Control (%)		Difference	Assumption[a]	Effect
	Pre ($N=320$) a	Post ($N=320$) b	Pre ($N=320$) c	Post ($N=320$) d	b − a	d − c	(b − a) − (d − c)
Know at least one method to prevent anaemia	61.6	85.3	70.9	88.4	23.7	17.5	6.2
Know at least one mode of transmission of intestinal parasites	32.8	60.6	50.9	68.8	27.8	17.9	9.9
Know that HIV can be transmitted from mother to child	69.1	87.5	81.9	92.8	18.4	10.9	7.5
Early breastfeeding	23.8	40.0	30.0	40.0	16.2	10.0	6.2

[a]Counterfactual assumption.

Table 5 Adjusted effect of the intervention on key indicators

Key indicators	Intervention		P	Control		P
	Adjusted OR[a]	95% CI		Adjusted OR[a]	95% CI	
Frequency of ANC						
At least once	1.476	0.876–2.486		0.813	0.537–1.232	
Four times or more	1.546	1.086–2.200	*	1.277	0.902–1.808	
Delivery with SBA	2.613	1.805–3.782	**	1.092	0.763–1.562	
Delivery at health facilities	2.499	1.746–3.578	**	1.866	1.343–2.593	**

Note: CI, confidence interval.
[a]Adjusted with age, literacy and economic status (electricity).
*$P < 0.05$.
**$P < 0.01$.

organized into four categories: appearance (attractive and durable), practical information (useful health information, more illustrations, usable for health education), convenience (easy to read/keep/carry, combined maternal and child records) and long-term value (can be used for future children).

All of the mothers mentioned that the size of the book and its illustrations were appropriate. When we showed the mothers the handbook's illustrations, all were able to correctly identify the meanings of the illustrations. Some of the educated mothers reported difficulty with certain terms, such as 'white

Table 6 Sociodemographic characteristics of interview participants

Sociodemographic characteristics	Mothers	Health centre staff	VHVs and TBAs
Number	20	8	10
Mean age (range)	26.8 (21–33)	37.5 (25–53)	50.8 (29–56)
Sex			
Male	0	4	4
Female	20	4	6
Education			
None	8	0	2
Primary school	7	0	2
Secondary school	4	4	2
High school	1	3	4

discharge'. Some respondents stated that, while understandable, some words required additional information to explain the underlying reason for the depicted event. Illiterate mothers reported that some content was difficult to understand; however, after additional explanations from nurses and midwives, they were able to understand the material and recall what was taught by looking at the illustrations.

We asked the mothers if they had shown the handbook to their husbands. Of the 20 mothers who responded to this question, 17 had shown it to their husbands. Some husbands showed interest and commented that the book was useful and contained meaningful illustrations. Some husbands explained the contents of the handbook to their wives and advised them to obtain ANC, avoid salty food, or refrain from working too hard.

We asked the health centre staff, VHVs and TBAs whether they used the handbook for health education; all of them answered in the affirmative. Some VHVs mentioned that it was initially difficult to use the handbook for health education; they were nonetheless able to provide health education using the handbook, however, and no longer found it difficult at the time of the interviews. Others mentioned that while the handbook was useful, health education was difficult because some mothers were reluctant to listen to the advice of the VHVs because it was inconsistent with their cultural beliefs.

Discussion

This study was the first to examine the effectiveness of the MCH handbook in Cambodia. Both the quantitative and qualitative results indicated that the MCH handbook positively influenced the promotion of ANC attendance, delivery with SBAs and delivery at a health facility. Further, the MCH handbook was associated with increased healthcare knowledge in mothers.

The DID analyses revealed that the MCH handbook effectively promotes the key indicators examined in our study (i.e. ANC attendance, delivery with SBAs and delivery at health facilities). The effect of the handbook on these variables was robust, even after controlling for sociodemographic indicators, except for ANC attendance at least once.

In Thailand (Aihara *et al.* 2006) and Bangladesh (Bhuiyan *et al.* 2006; Kusumayati and Nakamura 2007), use of an MCH handbook was associated with ANC acquisition. Our results were consistent with these findings, because use of the handbook was associated with an increase in ANC by more than four visits. However, the number of first-time ANC visits was not significantly greater after controlling for confounding factors. This may have been due to an already high level of coverage before the intervention. Although DID analysis indicated a positive impact of the intervention on this variable, the high existing level of coverage may have resulted in an increase that was too small to reach statistical significance.

The effect of the MCH handbook on delivery with SBAs and at health facilities has not been well explored. Baequni and Nakamura (2012) conducted a meta-analysis of five studies and found that the MCH handbook positively increased the likelihood of delivery at a health facility but did not increase SBA attendance. Osaki *et al.* (2013) found that ownership of an MCH handbook was associated with SBA-assisted delivery; however, the study compared women who owned the MCH handbook with those who received but misplaced it, indicating a possible selection bias whereby those who retained the handbook might have initially been more concerned with their childbirth. A recent study of MCH handbook effectiveness in Palestine (Hagiwara *et al.* 2013) using DID analysis showed that use of the handbook improves maternal health-seeking behaviour. However, in Palestine, the MCH handbook represented the first standardized home-based maternal and child record for the country; thus, a comparison could not be made between card-type home-based records and the MCH handbook.

Our study revealed that the MCH handbook significantly increases the likelihood of delivery with SBAs and at health facilities, even after adjusting for maternal age, education level and economic status. This improvement may have resulted from handbook distribution and enhanced communication between respondents and health professionals (Hagiwara *et al.* 2013).

Previous studies showed that the MCH handbook increases the likelihood of exclusive breastfeeding (Pandara 2006) and child immunization (Osaki *et al.* 2009, 2013). Handbook use is also associated with greater knowledge of the risks of membrane rupture (Hagiwara *et al.* 2013), ANC information, proper nutrition during pregnancy and child health care (Baequni and Nakamura 2012). Our study corroborates these results, indicating the advantage of the MCH handbook over current card-type or prototype maternal and child records.

The effect of the intervention on knowledge items ranged from −5.1 to 19.7. This may have been because some information was conveyed only in words, whereas other information contained illustrations. The quality of the illustrations may have also influenced respondent attention to certain items. In particular, respondents who received the handbook were not significantly more cognizant of the risk of severe bleeding after birth. The local belief system might have influenced this result. In rural Cambodia, people traditionally believe that maternal bleeding is necessary after delivery. It is thought that if a woman does not sufficiently bleed, the stagnant blood in her uterus will cause illness. Even though severe bleeding is presented pictorially in the handbook as a risk during pregnancy and the postpartum period, the message might not be strong enough to alter public opinion.

The qualitative analysis demonstrated that the attractive appearance of the handbook appealed to mothers who otherwise would not have obtained ANC. Moreover, as respondents became familiar with the midwives during the ANC appointments, they were more likely to have an SBA-assisted delivery. Increased ANC attendance also provided more opportunities for health professionals to provide mothers with health education regarding the importance of delivery with SBAs.

These findings may have resulted from the dual effects of the handbook: the health education provided by health professionals using the handbook and the illustrations that enable the effective conveyance of information to all mothers, irrespective of literacy level. Written material that contains similar health-related information to that relayed in health facilities may facilitate the recollection and comprehension of such information in mothers (Murira *et al.* 1996). Corroboratively, previous studies showed that educational materials, such as booklets and pamphlets, considerably improved maternal knowledge and beliefs (McMaster *et al.* 1996; Brown and Smith 2004; Thompson and Harutyunyan 2009).

The qualitative results of the effectiveness of the MCH handbook were remarkably positive. Almost all of the mothers and health workers preferred the handbook to the current record, thereby indicating adequate acceptance (similar to other home-based or consumer-held health records) (Mahomed *et al.* 2000; De Clercq *et al.* 2003). Respondents reported that they preferred the handbook because of the attractive appearance, practical health content, convenience of combined records and long-lasting value as a source of health information.

In Cambodia, different organizations have developed a variety of health cards and records for MCH programs, aiming for a specific health intervention at a time. They included the Child Health Card (growth monitoring and immunization record), Mother Health Record (ANC and delivery record), tetanus toxoid immunization card, birth control pill booklet and others. Some are focused on maternity and others on children. Some were developed as a medical record for professional use, whereas others were for laypeople. Although simple cards seem to be inexpensive and easy to produce, this can cause an overlap of programs, and the aggregation of various card productions may result in high cost. They also create confusion and inconvenience to mothers. Because maternal records and child records are kept separately, there is a lack of continuum of care from perinatal to infant care.

The MCH handbook combines information about both mothers and children. It records information about pregnancy, delivery and the postpartum period for mothers. It also records growth monitoring, immunization and childhood illnesses until a child reaches the age of 5 years. Thus, it acts as a bridging tool between mothers and children as well as prenatal to postnatal care.

Qualitative study results showed that women noticed the value of the handbook and wanted to keep it longer as a reference for child rearing and their own health. Some mothers showed it to their husband or daughters to read the educational section. It is not only for mothers and children but also for their family. Therefore, mothers would like to have the handbook durable and covered.

This study revealed that the MCH handbook is potentially more effective than a prototypical home-based maternal record in terms of health education material. The handbook is acceptable and feasible to implement and worth providing in developing countries.

There were several limitations to this study. First, reassessments could not be conducted on all mothers because of the low initial frequency of repeated ANC visits. Therefore, we evaluated the community rather than individual subjects. This led to a cross-sectional study and made it difficult to conclude the effect of the intervention at an individual level. However, as mentioned in the preceding text, the study revealed the effectiveness of the MCH handbook at a population level. When the proportion of mothers who attended ANC four times or more increased, individual-level evaluations with paired samples would be performed. In addition, the intervention was conducted 1½ years before the evaluation. This may not have been a sufficient period for the intervention to have a significant impact on the community as a whole. Finally, for the qualitative study, the answers of the participants might be biased in favour of the handbook because they had been informed of the usefulness of the handbook. However, the fact that some mothers living outside the intervention areas visited the intervention health centres and asked for the handbook showed the popularity of the handbook. At the request of both health professionals and mothers, we decided to introduce the handbook to the control areas after the study was completed.

Despite these limitations, efforts were made to maintain the quality of the quasi-experimental design throughout the intervention period. The results of both the quantitative and qualitative studies indicate that the MCH handbook may confer greater benefits than traditional home-based records.

Conclusions

We developed a Cambodian version of the MCH handbook and compared its effect with that of a prototypical home-based maternal record. Approximately 20 years have passed since the first home-based maternal record was introduced, so policy makers should consider more effective alternatives, such as the MCH handbook. Consistent and widespread dissemination of the MCH handbook may markedly improve maternal knowledge and behaviour and consequently promote safe delivery and child health in Cambodia.

Acknowledgements

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Conflict of interest statement: None declared.

Ethical approval

Ethical approval was obtained from the ethics committee of Shinshu University in Japan and the Ministry of Health in Cambodia.

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Session 3

Maternal and Child Health*1

—Work together and learn together for maternal and child health handbook—

JMAJ 57(1): 1-4, 2014

Yasuhide NAKAMURA[1]
(Takemi Fellow 1996-97)

It was quite a while ago that I studied in Boston as a Takemi Fellow, but the days I spent in the scholarship program still remain one of the most exciting and fruitful periods of my life. It was a year in which I encountered many different people, learned a lot, and came to realize many things that I hadn't noticed before. The participants of the program included a number of brilliant people from all over the world, who are now working in influential roles such as professors in Thailand, Korea, and Brazil. Through daily interactions with them, I found that they wanted to learn about Japan during the era when it was a developing country. They wanted me to share about the process of how Japan achieved a healthcare wonder. I didn't have the answers at that time, and through my discussions with these colleagues, I learned that Japan should be more aware of the value of its past achievements.

One thing that I came to appreciate in the course of these discussions was the magnificent decrease in Japan's infant mortality rate (**Slide 1**). Today, the world is striving to attain the UN Millennium Development Goal of reducing by two-thirds the child mortality rate over a 25-year period. Although countries are working towards this goal with the target year of 2015, many are frustrated by the slow progress. Japan reduced its infant mortality rate at twice that speed, cutting it down to one-sixth in 25 years, and this incredible achievement was based on the country's own initiative. At present, the average life expectancy at birth for females in Japan is 86.4 years, which is a surprisingly long life expectancy for anyone in the world. Everyone wants to know how this was achieved, and I feel that we need to understand and fully appreciate the value of this process.

This slide shows a comparison of the infant mortality rates in Japan and the US (**Slide 2**). The infant mortality rate in Japan declined rapidly after the end of the chaotic period following World War II, falling below that of the US in 1964, which just so happened to be the year of the Tokyo Olympics. Japan was still a developing country then. Although Japan developed the bullet train, it had to take a loan from the World Bank to do so. Despite this dependence on international assistance, Japan recorded a mortality rate lower than that of the US. What enabled this achievement? Japan's health indicators went up before the country developed economically, and this fact aroused considerable interest among American researchers. I conducted joint research with the team of Professor Wallace, who is an expert in maternal and child health, at the University of San Diego, as well as Dr. Hirayama and his colleagues at the Japan Child and Family Research Institute. We arrived at five reasons for Japan's low infant mortality rate.

*1 This article is a revised transcription of the presentation of the author which was delivered at the Takemi Program 30th Anniversary Symposium at the JMA office Tokyo on November 23, 2013.
Due to space limitations, not all of the slides shown in the original presentation appear in this article.

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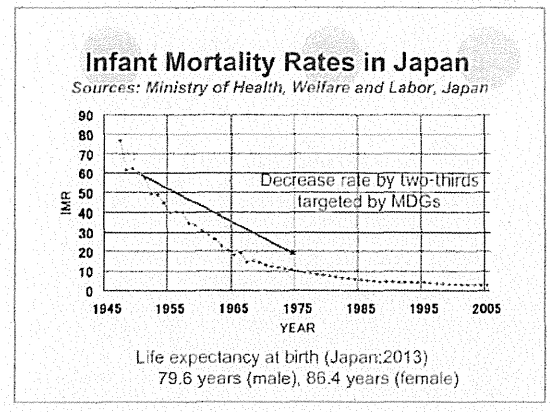
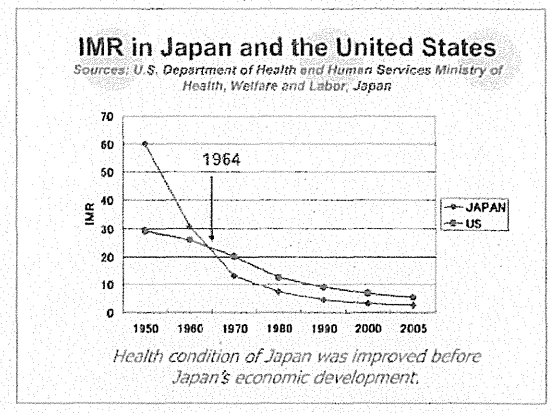
(Slide 1)



(Slide 2)

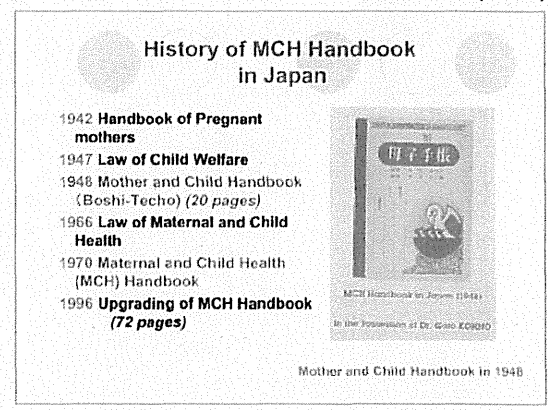


Among others, the second reason is universal health insurance coverage. The fourth reason is health checkups for expectant and nursing mothers and for babies and toddlers. The first reason is a narrow socio-economic gap. The fifth reason is the high social value placed on raising children. Because this study was conducted in the 1990s, there is some question as to whether these explanations still hold for Japan perfectly today. However, what we listed as the third reason—the maternal and child health handbook (MCH handbook)—was used then and is still used today.

The MCH handbook is a record of prenatal checkups, delivery, child development, and vaccinations. One feature of the handbook is that it treats maternal and child health as one. Another feature is that the parent keeps the handbook. Under the Maternal and Child Health Act, the handbook is provided for free to expectant mothers who submit a notice of pregnancy to the government. The handbook is divided into pages that are the same nationwide, as prescribed by the Ministry of Health, Labour and Welfare, and other pages.

Today, MCH handbooks are used in over 30 countries, but only in Japan the book was handed out to a pregnant woman upon submission of a notice of pregnancy to the government (**Slide 3**). This practice in Japan startles people in other countries, who would observe; "Do you really notify the government of such a private thing as pregnancy?" This has made me feel that the Japanese, who have continued to notify the government of pregnancies, have special attitude

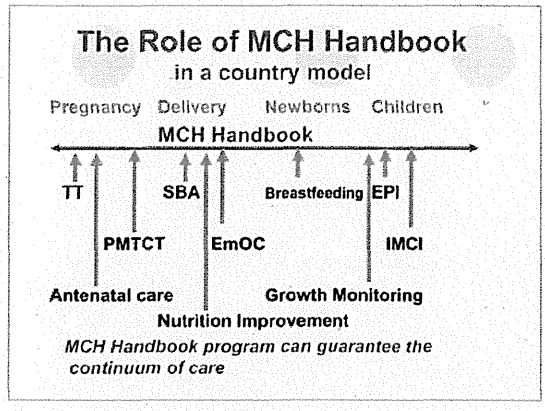
(Slide 3)



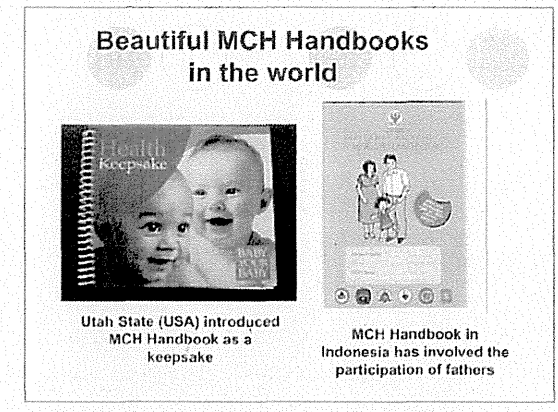
in this regard. MCH handbooks originated in Japan. Handbooks for expectant and nursing mothers were distributed with a food ration handbook during the war in 1942. Thereafter, Japan created the world's first MCH handbooks in 1948 in a way separately from but based on their predecessors. It was the first time in the world that a maternal handbook, pregnancy and delivery handbook, and child's handbook had been combined. Seventeen years later, "maternal and child handbooks" were legislated in Japan under the Maternal and Child Health Act. Later they were renamed "maternal and child health handbooks."

Let us consider the role of this handbook from a global health standpoint. It is clear that the handbook is not merely a pocket notebook (**Slide 4**). OB/GYNs or midwives conduct pre-

(Slide 4)



(Slide 5)



natal checkups. After the delivery, the midwife or a public health nurse conducts a newborn visit to the family's home. Infant checkups and vaccinations are conducted at a health clinic. Throughout the process of pregnancy and delivery, many different specialists are involved at different locations and different times in a continuous flow of events leading to the birth of a child. The question of how to ensure continuity across these different medical services is a major issue not only in developing countries but also in developed countries. In this respect, Japan has used MCH handbooks for the past 60 years to ensure a continuum of care by enabling the entire train of medical events from pregnancy to be grasped.

Now, realizing the usefulness of this tool, different countries are starting to introduce MCH handbook initiatives. Already more than 30 countries have started initiatives and the International Conference on MCH handbooks was held in Nairobi in October 2012. Dr. Kiyoshi Kurokawa and Kenya's Minister of Health attended the conference. This slide shows the Kenyan MCH handbook. It was created by a Kenyan pediatrician who studied at Tokyo Women's Medical University and is very familiar with Japan's MCH handbook. That physician said that the MCH handbook is the best tool for providing a continuum of care for mothers and children in Kenya, including fighting AIDS. Three hundred people from 25 countries, including African countries that have developed or envisage introducing MCH handbooks, gathered together for discussion.

The various MCH handbooks that have been developed in different countries are really interesting (**Slide 5**). They have been adopted not only in developing countries but also in developed countries. Utah in the US designed maternal and child handbooks as a keepsake to be passed on from mother to child. The person in charge of the program said that the state had copied Japan's MCH handbooks. Fathers appear on the covers of Indonesia's MCH handbooks.

In this context, an important element of any international cooperation is "Lessons Without Borders." When the Great East Japan Earthquake hit, Japan instantly turned from an assistance donor to an assistance recipient. In Sudan, which I visit often, high school students created a Great East Japan Earthquake Special Week, during which they made friends, raised money, and donated it to the embassy. They worked hard for a week to collect money for the people afflicted by the disaster. These efforts are really appreciated. I felt that in return, instead of interacting from the *donor-recipient* standpoint, we should develop relationships of mutual learning and cooperation among all the countries involved. The experience of developing countries regarding MCH handbooks has also been used for the improvement of Japan's MCH handbooks. Japan's Health Ministry conducted a study on MCH handbooks making use of a questionnaire developed in Indonesia. Color-printed pages were added for the first time to Japanese MCH handbooks with a revision in April 2012, following the examples of developing countries using color-printed handbooks. In response to the question from a developing country asking

whom MCH handbooks belong to, Japan wrote in the handbooks for the first time, "It is meaningful for you as parents to give the handbook to your child when he or she becomes an adult." We have reached a time when we can learn from each other in this way.

For your information, the 9th International Conference on MCH handbooks will be held in 2014 in Cameroon, which was the first country in the world to make a bilingual MCH handbook in English and French.

What I learned through my efforts to spread MCH handbooks outside Japan are the problems in Japan. Dr. Miriam Were (past Dean of the Faculty of Medicine at the University of Nairobi and Director of the United Nations Population Fund office in Ethiopia) has said that MCH handbooks are a miracle. We Japanese have come to take MCH handbooks for granted so much that we don't even realize what a blessing they are. People in Africa, on the other hand, say that Japan is a wonderful country because it has these amazing MCH handbooks. We need to take more notice of the high value of MCH handbooks. JMA physicians gathered here today should make an effort to improve MCH handbooks within our communities, adapting them to community circumstances and needs, for the benefit of the children who will take over Japan's future. That is what I learned in working with people from developing countries.

Comment

Shigehito ISHIGURO[2]

For us pediatricians, the maternal and child health handbook is an extremely important source of information for learning about the relationship between a mother and her child. They have been improved successively for ease of use, especially with the addition of information on management of the mother's body, check-ups after delivery, and vaccinations, as well as the revision after each amendment to vaccination and other programs. In the past, I was involved in revising the maternal and child health handbook. After hearing today's speech, I agree with Dr. Nakamura that a maternal and child health handbook should be considered a special gift that carries a message from the mother to her child. A mother can write down her worries, joys, expectations, and many other feelings when they occur while raising her child and, as Dr. Nakamura said, give it to the child. I would like people to know that this kind of maternal and child health handbook, in addition to being a gift filled with parental love, contains extremely important information connected to health over an individual's entire lifespan, including school health, community health, and developmental health. I hope that maternal and child health handbooks will evolve so that the information in them may be used even after the child reaches adulthood.

There are eight United Nations Millennium Development Goals, the 4th and the 5th of which are related to maternal and child health. Goal number 4 is to reduce child mortality. Shortly after World War II, the infant mortality rate in Japan was 78 or 80 per 1,000 births, but today it is around 2.3 in Japan, which now has the lowest child mortality rate in the world. In the developing world, on the other hand, many countries are tracking numbers like those seen in Japan following the war at around 80, while there are some countries, especially in sub-Saharan Africa, with numbers as high as 157.

As for the 5th UN Millennium Development Goal—to improve maternal health—the developing world has the inconceivably high number of 480 delivery-related deaths per 100,000 pregnancies. Making use of maternal and child health

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handbooks in countries such as these would be very important.

In particular, three conditions are necessary to derive the full value of the handbooks. The first is to raise the national literacy rate, especially the literacy rate of women. The second is to improve knowledge of public health. Lastly, the most important thing is to create countries where children can be born and raised with peace of mind—that is, create peaceful societies that are free of conflict. This is the most important thing for a country that uses maternal and child health handbooks.