Diagnostic and clinical decision support systems for antenatal care: is mHealth the future in low-resource settings?
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The Dutch Working Party ‘International Safe Motherhood and Reproductive Health’ aims to contribute to improvement of the reproductive health status of women around the globe, in particular by collaborating with local health workers (http://www.safemotherhood.nl). The Working Party is part of both the Dutch Society of Obstetrics and Gynaecology (NVOG) and the Dutch Society for International Health and Tropical Medicine (NVTG). The activities that are undertaken under the umbrella of the Working Party can be grouped into four pillars: education, patient care, research and advocacy. Research activities are undertaken by (medical) students, Medical Doctors in International Health and Tropical Medicine and many others. Some research activities develop into PhD-trajecories. PhD-candidates all over the world, Dutch and non-Dutch, work on finding locally acceptable and achievable ways to improve the quality of maternal health services, supervised by different members of the Working Party. Professor Jos van Roosmalen initiated the Safe Motherhood Series, which started in 1995.

The Safe Motherhood Series

- Safe motherhood: The role of oral (methyl)ergometrin in the prevention of postpartum haemorrhage. (Akosua N.J.A. de Groot), Nijmegen, 1995
- Safe motherhood: Perinatal assessment in rural Tanzania. (Gijs E.L. Walraven), Nijmegen, 1995
- Safe motherhood: Confidential enquiries into Maternal Deaths in Surinam. (Ashok S. Mungra), Leiden, 1999
- Safe motherhood: Reproductive health matters in rural Ghana. (Diederike W. Geelhoed), Leiden, 2003
- Safe Motherhood: Vaginal birth after caesarean section in Zimbabwe and The Netherlands (Wilbert A. Spaans), Amsterdam AMC, 2004
- Safe Motherhood and Health systems research: Health care seeking behaviour and utilisation of health services in Kalabo District (Jelle Stekelenburg), VU University Medical Centre, Amsterdam, 2004
- Safe Motherhood. Enhancing survival of mothers and their newborns in Tanzania (Godfrey Mbaruku), Karolinska Institute, Stockholm, Sweden, 2005
- Safe Motherhood. Severe maternal morbidity in the Netherlands: the LEMMoN study (Joost Zwart), Leiden University Medical Centre, the Netherlands, 2009
- Safe Motherhood. Obstetric audit in Namibia and the Netherlands (Jeroen
van Dillen), VU University Medical Centre, Amsterdam, the Netherlands, 2009
- Safe Motherhood. Confidential enquiries into maternal deaths in the Netherlands 1993–2005 (Joke Schutte), VU University Medical Centre, Amsterdam, the Netherlands, 2010
- Delay in Safe Motherhood (Luc van Lonkhuijzen), University Medical Centre Groningen, the Netherlands, 2011
- Safe Motherhood: Medical Mirrors: Maternal care in a Malawian district (Thomas van den Akker), VU University Medical Centre, Amsterdam, the Netherlands, 2012
- Safe Motherhood: Leading change in the maternal health care system in Tanzania: application of operations research (Angelo Nyamtema, Ifakara, Tanzania), VU University Medical Center, Amsterdam, the Netherlands, 2012
- Safe Motherhood: Health professionals and maternal health in Malawi: mortality and morbidity at district level (Jogchum Beltman), VU University Medical Center, Amsterdam, the Netherlands, 2013
- Safe Motherhood: Obstetric emergencies in primary midwifery care in the Netherlands (Marrit Smit), Leiden University Medical Center, the Netherlands, 2014
- Safe Motherhood: Improving maternal outcome in rural Tanzania using obstetric simulation based training (Ellen Nelissen), VU University Amsterdam, the Netherlands, 2014
- Safe Motherhood: The aberrant third stage of labour (Giel van Stralen), Leiden University Medical Center, the Netherlands, 2015
- Safe Motherhood: Terugvinden van waardigheid, community-based sociotherapie in Rwanda, Oost-Congo en Liberia (Cora Bakker), VU University Amsterdam, the Netherlands, 2016
- Safe Motherhood: Severe acute maternal morbidity, risk factors in the Netherlands and validation of the WHO Maternal Near-Miss Tool (Tom Witteveen), Leiden University Medical Center, the Netherlands, 2016
- Safe Motherhood: Getting the job done, providing lifelong HIV-treatment in settings with limited human resources for health: innovative approaches (Marielle Bemelmans), VU University Amsterdam, the Netherlands, 2016
- Safe Motherhood: Identifying needs for optimizing the health work force in Ethiopia (Tegbar Yigzaw Sindekie), VU University Amsterdam, the Netherlands, 2017
- Safe Motherhood: Improving frontline health workers’ performance in low resource settings; the case of Ethiopia (Firew Ayalew Desta), VU University Amsterdam, the Netherlands, 2017
- Safe Motherhood: Increasing access to anaesthesia in Ethiopia: task shifting (Sharon J.N. Kibwana), VU University Amsterdam, the Netherlands, 2017
- Safe Motherhood: Diagnostic and clinical decision support systems for antenatal care: is mHealth the future in low-resource settings? (Ibukun-Oluwa O. Abejirinle), VU Amsterdam, the Netherlands, 2018
Acknowledgements
There is only one name on the front cover of this thesis but there are many to whom I owe my appreciation and without whose support this work would not have come to life. Although there are too many to mention, it gives me great pleasure to acknowledge some of these individuals and groups by name.

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Occasionally I am asked how I have survived working with four supervisors in three different countries. My response is that the richness of being mentored by a gender-balanced team of experts has been indispensable to the success of my PhD. I am therefore indebted to my supervisors. Prof. Jos van Roosmalen whom I had met and admired long before he agreed to be my promotor. Thank you for challenging me repeatedly to avoid labelling pregnant women as patients and for your detailed timely feedback on my manuscripts. Prof. Vincent De Brouwere, whom I have dubbed my research grandfather and with whom I frequently disagree to agree. I sincerely appreciate our discussions; they have shaped my critical thinking and scientific skills. Prof. Marjolein Zweekhorst, I am honoured to have spent the last three years under your guidance. Thank you for teaching me the principle of the lowest hanging fruit, for helping me navigate the rough patches of the PhD, trusting my growth through this process, for introducing me to your family and encouraging me to aim for a work-life balance. Because you allowed me learn from your experiences during our weekly meetings, I am a better person and researcher! Dr. Azucena Bardaji, despite the physical distance, you actively and consistently contributed to supporting the rigour and quality of my research. Thank you for taking the time and for being responsive to my many emails and deadlines. As a supervisory team, you have had significant impact on me personally and professionally. Thank you all for a rewarding learning experience.

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Hora est!
Acknowledgements
About the Author
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Ibukun was born and raised in Kano, Nigeria and attended boarding school in Adesoye College Offa, Nigeria after which she gained admission to medical school. In 2006, as a medical trainee in a tertiary-level teaching hospital, a fatal incident brought home the harsh reality of the weak state of her country’s health system. This resulted in questions that birthed a desire to become a public health practitioner. She later migrated to Ukraine where she eventually earned her Medical degree in 2014 from the Crimea State Medical University Simferopol, alongside a Bachelor of Arts in Health Sciences (specialisation in Community and Health Psychology) from the University of South Africa, graduating cum Laude. While in Crimea, under the inspiring instruction of Associate Professor Kamilova Irina Kokharovna, an Obstetrician, Ibukun became interested in maternal sexual and reproductive health and began actively focusing clinically and on advocacy and extracurricular projects, in women’s health.

In her search for broader solutions to the state of health care in Nigeria and other sub-Saharan African countries, Ibukun took a detour after her clinical training and went on to complete a MSc. Global Health cum Laude from Maastricht University supported by the Elisabeth Strouven scholarship. During this period, she had the opportunity to develop her research skills in India and Rwanda, working with colleagues from different nationalities and disciplines. From there on, she continued to pursue a career in research and Global Health, joining the Athena Institute, Vrije University Amsterdam in September 2015 as an Erasmus Mundus Joint Doctorate (EMJD) fellow. Under this framework grant agreement, Ibukun was hosted as a PhD researcher at Athena Institute, with affiliations to two partner institutions - Barcelona Institute of Global Health (ISGlobal), Spain and the Institute of Tropical Medicine, Antwerp. Her PhD research stayed true to her interest in maternal health and her passion for strengthening health service delivery in Africa. During the three years spent conducting her doctoral research, she also devoted some time to educational responsibilities as a tutor and Masters thesis supervisor.

After submitting her PhD thesis in August 2018, Ibukun joined the Health Systems Unit headed by Prof. Bruno Marchal at the Institute of Tropical Medicine, Antwerp as a Postdoctoral Research Assistant. In this role, she continues to build upon her work on mHealth in low-resource settings, women’s health, realist methodology and health policy and systems research.