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Maternal and Child Health Service Delivery: Assessing Antenatal Care Uptake and Birth Outcomes in Nairobi County

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Abstract

The County of Nairobi has a high coverage of antenatal care and skilled attendance at birth, but these indicators do not tell much about the timing of when women seek care first or what occurs once a complication has been identified. This narrative review analyses the antenatal uptake, the nature of the care and the outcome of births based on estimates of county surveys, the research in the Nairobi settlements and maternity hospitals, and the selected comparative studies. Women aged 15 to 59 who delivered at least 1 live child in the past three years reported 4 or more antenatal visits in Nairobi in the 2022 Kenya Demographic and Health Survey, 81%. In a Kibera cohort of 1,652 women followed in 20162019, 99.6% of the women attended at least once, 30.0% began during the first trimester and 4.5% made eight or more visits. Nairobi hospital studies found that attendance was limited and screening was not done, which was related to still birth; there was also community evidence which showed that maternal nutrition support was related to low prevalence of low birth weight. Causal interpretation is restricted by selection into hospital care and reduced pregnancies. The most powerful implication is that Nairobi ought to quantify the period between the initial consultation and the birth: either women get proper screening, get results, do referrals and go to a facility where they will be able to deliver. The article suggests a county review process, which links these measures to gaps in care that can be prevented.

Key words: *antenatal care, birth outcomes, effective coverage, maternal health, Nairobi County, neonatal health*

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Introduction

Nairobi provides a convenient experiment on high coverage of maternity services to mothers and newborns. According to the 2022 Kenya Demographic and Health Survey (KDHS), 81 percent of Nairobi women aged 15 to 49 with a recent live birth had had at least four antenatal visits, as compared to 66 percent in the country. The county had 99% of recent live births by skilled providers. These statistics prove that exposure to maternity services is prevalent. They fail to demonstrate whether the initial consultation occurred in time to respond to a risk that was previously identified, whether a woman could access the tests recommended,

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or whether the maternity unit was able to receive the results when a woman got to labour (Kenya National Bureau of Statistics [KNBS] & ICF, 2023).

The difference is important in a city where a woman can go to a private clinic on the way to work, receive tests in other places and give birth at a state hospital. The service can be properly documented in each facility and there is no single record of the entire pregnancy. To the woman, the questions concerned are pragmatic: who is to talk about an abnormal outcome, where will she be taken in case labour starts at night, and will the team she is taken to know why she was sent there? A Nairobi study of fluctuations in planned delivery facility reported how a situation around the time of birth interfered with the plans made in pregnancy (Naanyu et al., 2020). Effective antenatal care assessment should thus be measured, in part, by events outside the antenatal clinic.

Antenatal care (ANC) includes preventive care, clinical assessment, prenatal information and care. The minimum contacts suggested by the World Health Organization (WHO, 2016) are eight, starting within the initial 12 weeks. The word contact underlines an experience where a woman is taken care of and is able to share concerns. The older four visit measure is still effective since it is reported in household surveys and in historical studies. When we get to four visits and have the entire recommended schedule, we answer other questions. Neither tells about the quality of a single encounter. The clinical context of understanding these differences is in the national obstetric and perinatal guidelines in Kenya (Ministry of Health, 2022).

There are three questions in this review. What is the relationship between uptake and timing and measure of attendance? What does Nairobi data indicate regarding the association between antenatal care and stillbirth, preterm birth, low birth weight and neonatal survival? What are the gaps that can be addressed using available evidence by county health managers? The area of interest is the pregnancy and birth episode which continues to the neonatal period where evidence addresses survival after birth. The subsequent development or well-being of a child is out of the scope of the assessment. The article is evidence-based, and no new patient information is provided.

Literature review

What an antenatal contact can achieve

At various points in pregnancy, antenatal contacts provide varying opportunities. Early consultation may define gestational age, define any obstetric complications in the past and institute recommended screening. Subsequent contacts enable the party to read the variation of blood pressure, track fetal development and settle on a delivery schedule. A seemingly promising initial visit cannot predetermine all the complications that arise in the future. Similarly, multiple appointments sequentially near term do not re-create a chance to act on a condition during pregnancy. The time consideration is pertinent to the experience of a woman and the utility of a service in clinical practices by the WHO schedule and guidelines of Kenya (Ministry of Health, 2022; WHO, 2016).

There are two ANC measurement studies that justify how attendance on its own can be misleading. Hodgins and D'Agostino (2014) separated coverage and provision of vital elements. Benova et al. (2018) demonstrated that women who reported an equal number of visits might be provided with varying sets of services. Blood pressure measurement, blood sample and discussion of warning signs are other types of work. Even a positive response to every question in the survey would leave open the issue of whether the provider clarified an outcome or provided a follow-up. In the case of Nairobi, a reasonable minimum would be to look at contact, service received and action taken separately. They both demand varying evidences and propose varying solutions in case of poor performance.

These measurement concerns are clinically weighted by research on neonatal survival. Arunda et al. (2017) associated neonatal mortality with ANC characteristics based on the Kenyan national survey data. Neupane

and Doku (2019) identified a relationship between the quality of ANC and neonatal survival in several countries. Kuhnt and Vollmer (2017) also studied the use of services and child outcomes through household surveys. These analyses prove that the care content is worth considering in settings. Their estimates are an amalgamation of health systems and various referral capacity, disease burden and patterns of poverty. They are not able to inform Nairobi managers how many deaths would be avoided by a change to a specific county clinic.

Access within an urban health system

The journey which a map may represent as a short one can be a trying journey in reality. The same morning may require money to get transport, leave to do paid jobs and child arrangements. As soon as a woman enters a clinic, privacy and staff treatment are also the factors influencing the cost of coming back. Thaddeus and Maine (1994) differentiated delays in making the decision to seek care, a facility and getting enough care once in the facility. Determinants of use of delivery services were then studied by Gabrysch and Campbell (2009). When applied to ordinary ANC, it guides their work towards repetition of journeys. The method of attendance should not be required on all of the later visits.

Nairobi studies also defy the belief that households use the closest or most technically competent provider. Cost and the state of facilities were also brought up by women in Dandora, as well as their staff experience and worries about the baby (Oluoch-Aridi et al., 2020). In a different study on Nairobi, the perceptions of women in relation to the quality of maternity facilities did not always differentiate the quality of the facilities based on higher measured quality in technical terms (Siam et al., 2019). Care features that patients can directly observe are clean space and respectful communication. Skills of handling an obstetric emergency are more difficult to test prior to an emergency happening. Asking pregnant women to confirm that capacity shifts a duty which is with service organisers.

Studies of vouchers and cash assistance identify an aspect of access that county programmes can change. Bellows et al. (2013) and Amendah et al. (2013) compared facility delivery in informal settlements in Nairobi to a reproductive health voucher programme. Cohen et al. (2017) studied cash transfer and maternity care planning assistance in Nairobi. These researches covered decisions or utilization of a facility, which are useful results as such. The allegations of newborn survival should be further supported. The availability of financial support enhances survival chances but it also partly depends on the ability and the expertise of the facilities that the women will afford to access.

Birth outcomes require different explanations

Preterm birth is a birth that is completed before the due gestation period of 37 weeks. A low weight of a newborn below 2,500 grams is low birth weight, irrespective of the gestation age. There is overlap between the categories, though, a baby born at term and a baby born early at the right weight have different clinical histories. The nutrition support during pregnancy might be important to the growth of a fetus, and screening of severe maternal disease may result in a medically-indicated preterm birth to save the maternity or infant. That difference would be blurred by perceiving every early birth as an ANC failure. Mothers nutrition and preterm birth studies in Nairobi demonstrate the importance to document weight and gestation (Nyamasege et al., 2019; Wagura et al., 2018).

Stillbirth and neonatal death are also to be interpreted differently. Research can specify the stillbirth of a gestational threshold; this review states the source threshold where the comparison is made. Neonatal mortality relates to the deaths of live babies within the first 28 days. A pre-laboral death poses different questions compared to a post-distress laboural death or post-birth deterioration. Evaluation of the antenatal services must also be done with respect to the time of identification, the reaction and the follow up care. Research on stillbirth at Nairobi hospital and studies on inpatient neonatal care shed light on various aspects of this chain (Gwako, Were, et al., 2021; Murphy, Gathara, Mwachiro, et al., 2018).

Methodology

The article employs a systematic narrative review. A narrative method was suitable since the sources have different designs to respond to related questions: a county household survey quantifies coverage, interviews characterize barriers, hospital comparisons investigate associations and intervention studies evaluate specific changes in care. The review aimed at finding evidence that would be relevant to uptake, content or outcomes in Nairobi County. It also wanted work which would explain how the indicators should be interpreted or an improvement which Nairobi should judge. It was not intended to be a comprehensive systematic review and no pooled treatment effect was calculated.

Searches were done in Nairobi, Kibera, Dandora, informal settlements, Pumwani and Kenyatta National Hospital on the combination of Nairobi, Kibera, Dandora, informal settlements, Pumwani and Kenyatta National Hospital with the terms of antenatal attendance, first-trimester booking, maternity facility choice, stillbirth, birth weight, prematurity and neonatal mortality. Records in PubMed were searched, journal pages, the official KDHS county fact sheet and guidance in WHO and Kenya Ministry of Health were consulted. The sources prior to November 2026 were taken into account. Studies were prioritized according to the setting, population, outcome and study design identified. Studies that were older than Nairobi were not discarded as they offered a historical comparison or described how services were arranged. The year of publication was separated by the year of data collection wherever there may otherwise be an apparent change over time.

The evidence was systematised around three populations. In the case of county coverage, a survey was the most desirable source due to the reporting of results among Nairobi residents. In the case of patterns within neighbourhoods, settlement and eligibility criteria were mentioned and community cohorts and qualitative studies were used. The care processes and clinical associations were studied with the help of facility studies, taking into consideration the fact that a hospital admission is not a random sample of county pregnancies. Another set of national and international sources provided definitions, explanatory models or intervention evidence. Findings from elsewhere in Kenya were not substituted for missing county estimates.

On every numerical comparison, the review took into account the possible people who could be included in the denominator, the time period of reference, the exposure, the result and the primary alternative explanations. Visits counts were differentiated to individual features of care like tests received. Case-control odds ratios are presented as odds ratios, and not as absolute risk. Two articles were read as complementary analyses but not independent replications where two articles had overlapping investigators, populations or services. Mechanisms were interpreted qualitatively; the number of times that an experience was present in an interview study was not considered as its prevalence among county citizens.

Several limitations follow. Individuals with a terminated pregnancy earlier than 15 weeks, individuals who relocated and those whose outcome is not documented may not be captured in specific sources. Facility records may not include home births and post-discharge outcomes. Previous encounters can be influenced by recall; no record made does not prove that a procedure was not done. The review did not directly evaluate single medical record, formally evaluate study bias or estimate county estimates using survey microdata. Its conclusions thus highlight stable observations, viable explanations and gaps which a future assessment can address.

Findings

Entry into care is widespread, but timing varies

The county number of 81% of four or more visits is the right starting point of describing Nairobi residents. It is a definition of women whose last birth was live within two years prior to the survey and their last live birth. It omits otherwise similar woman who had only one pregnancy in the time, which resulted in stillbirth.

In the case of the separate measure of skilled attendance, births are the denominator. Subtracting the two percentages would then be wrong and determining the difference as those women who came to deliver but had insufficient ANC. The survey does not give a count of individual transitions between one service to another but two population measures (KNBS & ICF, 2023).

The entry and continuity are seen through the community study carried out in Kibera. Ouma et al. (2026) evaluated 1,652 women with ANC data and known 28-week and above birth outcomes in 2016-2019. Of these, 1,645 were at least once, 1,104 at least four times and 74 at least eight times. Only 495 started in the first trimester. A service monitoring the first measure would have an almost universal attendance; a service monitoring early booking would detect a missed opportunity of most participants. The cohort is pre-county survey and includes one settlement and selects pregnancies that have a known outcome. Its outcome is impossible to subtract to the county estimate to gauge a modern Kibera disadvantage.

Previous studies in Nairobi informal settlements had already established that high attendance coexisted with late initiation and socioeconomic disparities in attendance (Fotso et al., 2008). The fact that this pattern is repeated in the literature is more convincing than an assertion of the exact rate of change. A woman that initially makes a late booking can still receive all the follow up appointments that can be offered to her. The fact that she was only recorded by the total number of visits makes her experience an interchangeable one with the one of a woman who made an early registration and failed to receive further care on numerous occasions. To understand which of these issues they are attempting to address, clinic teams must have gestation at first attendance and the period between appointments.

An example of why service design should not rely on a single type of evidence is age. In the cohort of Kibera, young women less than 20 years old were more likely to book early as compared to their older counterparts 35 and above (Ouma et al., 2026). In a Nairobi settlement, adolescent girls, however, reported the need to hide pregnancy and evade detection when seeking care (Achieng et al., 2025). Both conclusions may be valid. Girls who reveal a pregnancy and join a cohort do not have to become the face of the women who are most deterring to disclosure. A county programme could provide confidential methods of getting into care without supposing that all adolescent populations are later than all older populations in getting into care. It should also explore real life challenges encountered by older women with work and care demands.

Stillbirth is associated with both attendance and content

The closest Nairobi evidence that ANC is associated with a birth outcome is a case-control study conducted in four tertiary hospitals. Investigators recruited 214 stillbirths and 428 women with live births at 2842 weeks between August 2018 and April 2019. The odds of stillbirth among women who had not attended ANC were greater than those that attended ANC (odds ratio 4.1, 95% confidence interval 1.610). Higher odds were also related to one or two visits as opposed to four visits. Since controls were sampled specifically, there is no estimate of the rate of stillbirth in the county because the ratio of cases to all participants does not provide an estimate. The article is enlightening regarding case-control differences in the context of the study (Gwako, Were, et al., 2021).

The same research identified reduced chances of stillbirth when indicators like measurement of haemoglobin, blood grouping and testing of HIV and syphilis were documented. These signs are not synonymous treatments. Blood grouping may help prepare in case of complication; a syphilis test can reveal an infection that needs responding. Both can also find a clinic that has more consistent supplies or superior records. A county reviewer of a stillbirth should then inquire as to what the test indicated, who saw the outcome and whether the woman was given the prescribed course of action. The use of counting tests would have left the most significant portion of the investigation undone (Gwako, Were, et al., 2021).

An example of a historical nature demonstrates that it also depends on the test quality to give a result back. Fonck et al. (2001) tested the effectiveness of decentralised antenatal syphilis screening in Nairobi. The

clinics were fairly impressive with screening, treatment and partner notification, however quality control detected false-positive and false-negative scores. The lesson to the present service design has to do with the organisation of testing rather than the performance of the current assays. A shift in position of a test, closer to women will eliminate a trip but will generate new supervisory and supply and checking work. An audit conducted at a county level wherein every test carried out was documented would fail to capture an erroneous outcome and a legitimate outcome that has not been pursued by any clinician.

The association is further complicated by clinical risk. The analysis using both obstetric and medical variables of stillbirth conducted in Nairobi has shown that it is crucial to consider complications in this group (Gwako, Obimbo, et al., 2021). There are high-risk patients whose visits are more frequent because clinicians know they are in danger; and those who visit a referral hospital with the fetus dead, as they have never been to a referral hospital before. Greater initial risk can be therefore indicated by more appointments and substantial care in other locations may be hidden by a final hospital record. To interpret a difference between two maternity units, the county would have to differentiate between women who were booked in the maternity units and those who were transferred and to determine fetal status when the woman was evaluated by the referring and receiving teams.

Birth weight and gestation point to different opportunities

A more precise instance of what can be altered with the help of antenatal support is provided by community evidence in Nairobi. Low birth weight among 1,001 individuals in informal settlements was found to be 2.5% among the intervention group of maternal nutrition counselling and 6.7% in the comparison group. The adjusted odds ratio of the intervention group was 0.26 (95% confidence interval 0.10-0.64). This result relates to a specific intervention given to a specific group. It helps in the assessment of the content of nutrition counselling, such as the capability of households to take action on it. This does not mean that another regular visit would yield the same difference (Nyamasege et al., 2019).

To practice, the distinction that is relevant is that one records that he gave that advice and knows what happened at home. The suggestion to consume more diverse meals can be technically correct but not within the means of the household. One of the follow-up questions that may help is what type of food a woman might be able to get, why she was not able to follow the advice and whether she requires any other assistance. At birth, the same pregnancies all the way to a measured newborn weight would give a more informative evaluation of the birth than the number of counselling encounters. The result should be accompanied by the proportion of newborns actually weighed: what appears to be an improvement in coverage in measured babies may mask a decline in coverage among those born elsewhere (Nyamasege et al., 2019).

In their study sample, Wagura et al. (2018) found that the prevalence of preterm births in Kenyatta National Hospital is 18.3%. Some of the factors that were found to be linked with prematurity were previous preterm birth, multiple gestation, pregnancy induced hypertension and other obstetric factors. These results help to advise careful obstetric history-taking and referral planning. They are unable to determine the incidence of preterm birth in the Nairobi residents since the hospital is referred to with complicated pregnancies. Mochache et al. (2018) followed up women who visited an antenatal clinic in a Pumwani cohort and discovered a correlation between antenatal depressive symptoms and preterm birth. The research indicates a little-recognized area of care; it does not define that screening is the sole measure that will avert prematurity.

The two studies of hospitals also explain why contact totals are poor univariate predictors. A woman who gives birth at 32 weeks is not able to attend the contacts planned in the final weeks of a term pregnancy. Assuming that her overall number of visits is compared to those of a woman who delivers at 40 weeks, early delivery itself assists in identifying the exposure that allegedly causes it. A superior comparison would be made between the care that the same gestational landmark has received in ongoing pregnancy. As an illustration, it might review the number of women who were still pregnant at 28 weeks who had taken

specified assessments by that time, and then track results since that time. Spontaneous labour and a clinically indicated early delivery where documentation allow would be identified separately in the delivery record.

Care during labour and after birth changes the interpretation

Pumwani evidence shows the reason why the results discovered during pregnancy should reach the labour ward. The odds of birth asphyxia were much higher in cases of complications during labour in a case-control study; the adjusted odds ratio was 24.26 and the confidence interval was wide, 7.65 to 76.95 (Wagathu et al., 2026). This is an estimate of the relationship in a hospital sample. This is not to be construed as the impact of a certain mode of delivery or as a forecast of a given pregnancy. Its clinical implications are that a documented history of antenatal cannot replace the ability to identify and act on deterioration after labour has set in.

The KDHS fact sheet reports at the county level indicates that Nairobi has a neonatal mortality rate of 20 per 1, 000 live births. The county mortality estimate includes the ten years before the survey as compared to the national estimate which includes five years. The ANC coverage indicator is a much briefer period. Relationships between the mortality figure and the number of the same pregnancies as in the four-visit indicator would establish an association that is not present in the data (KNBS & ICF, 2023). Discharge deaths are also included in a resident based neonatal mortality estimate. On the other hand, a maternity ward that only reports deaths prior to discharge may fail to capture a homeborn or transferred death of a baby.

The Nairobi cohorts of neonatal inpatient care reveal the stakes in post-delivery care. The capacity distribution in the public, private and mission hospitals was recorded in a county assessment (Murphy, Gathara, Abuya, et al., 2018). The evaluation of 28 participating facilities, based on 1,184 admission episodes and projected population need, found that there was effective coverage of inpatient care of sick newborns about 25 with a range of estimates of 21 to 31% (Murphy, Gathara, Mwachiro, et al., 2018). This historical estimate relates to the number of babies in need of inpatient care at birth and not every baby or prevailing performance. It however finds a tangible flaw in the evaluation of a system based on competent delivery only: the baby can be born in a place that will not be able to offer the baby the care he/she will then require.

The reaction in the post-labour phase is known to be amenable to improvement. A cluster-randomised facility trial carried out in Kenya and Uganda compared a package of intrapartum and immediate newborn care of preterm and low-weight babies. It had improved survival rates among the intervention group on its combined endpoint (Walker et al., 2020). The trial provides a rationale to trial team-based improvement as well as improved ANC; its treatment effect is not a Nairobi estimate. In situations where a death review reveals a delay in the provision of urgent newborn care, dispatch, the receiving unit and staffing at the appropriate time of day should be held responsible. Further antenatal counselling will not fix a receiving bed which is unavailable.

An approach that would be helpful in interpreting a perinatal death is to rebuild the sequence but not begin with a presumed cause. Take the case of a woman who, upon a visit to the clinic, her blood pressure is recorded as raised and her baby dies later in a referral unit. The gestation and results of the first assessment, the duration that the referral was made, the condition of the woman on arrival and what occurred during labour and care of the newborn are required by reviewers. An absence of documentation at any one point leaves a question, not proof of negligence. With the timeline that belongs to both groups, it is possible to ask the teams to go through it and understand whether the actionable failure was performed prior to departure or during the transport or after reception. The family ought to be given an opportunity to provide information regarding journeys and waiting that is not present in either of the records.

What women can change and what providers must change

The intersection between finance and facility choice has implications to county planning. Trials in Nairobi cash-transfer had identified that payment and advance choice of delivery facility increased the probability of delivery in a facility that met the newborn care standards, but did not do so in obstetric care standards studied (Cohen et al., 2017). This finding provides a rationale to combine the support of childbirth with credible information regarding maternal and newborn abilities. It also warns against punishing a woman who reverses her decision when labour occurs without notice or when a provider recommends a referral. A plan is not very bad as long as it provides a safe and achievable goal.

Nairobi interviews indicate further that a county programme may enquire of women what aspects of care they were comfortable with that made them return to care, and what aspects led them to care elsewhere (Naanyu et al., 2020; Oluoch-Aridi et al., 2020). A Kenyan study on the relative perceptions of women and providers regarding person-centred maternity care provides an additional account on the communication and dignity (Sudhinaraset et al., 2019). A general score of satisfaction may not be useful in improving early uptake as an anonymous account of being discussed in earshot of other patients can be more helpful. A facility can alter the location of consultations, the method of announcing and seeking consent. Providing a confidential appointment will not help a lot when the next queue will reveal the purpose of attendance.

Conclusion and recommendations

Most of the women covered in the available studies of Nairobi are contacted by antenatal services, although the evidence varies significantly depending on the question posed. County level has four visits. Early entry and completion of eight visits were much less common in the Kibera cohort. Nairobi studies relate narrow ANC and screening gaps to still-birth, demonstrate a hopeful nutrition intervention to low birth weight, and demonstrate that care during labour and postnatal can change the potential of a low-weight newborn. None of the reviewed sources determine an exclusive causal impact of ANC attendance on birth outcomes of the entire county. The helpful policy question is in what way a certain service can ensure the next step of care.

To begin with, timing should be accompanied by attendance in county and subcounty maternity teams. In the case of a cohort of pregnancies initially seen at a facility, they need to note the percentage of bookings made by 12 weeks, the percentage with an unknown gestational age at booking and the percentage made as transfers. An independent resident-based estimate must remain to characterize women who do not enter facility registers. Appointment offers and attendance must be recorded in different categories: the correct response varies in cases where the next available appointment is too late and cases where an offered appointment interferes with work. Age and neighbourhood comparisons of these measures can determine where confidential booking, flex or community support could be locally trialled.

Second, few clinically meaningful actions should be audited by facilities, starting to finish. In the case of blood pressure, say, the audit would inquire whether it was measured, whether an abnormal finding was measured and whether the specified review was performed. In the case of laboratory screening, it would follow the order, result, explanation and action between encounters. Clinic and lab personnel must review identical sample of records concurrently and assign missing outcomes to non-returning women. In cases where a test involves a separate payment or a trip, patient accounts can be used to determine the reason behind the halt of the process. Facilities are supposed to repeat the process of audit once they have tackled the particular hindrance they encountered.

Third, maternity units must negotiate an effective handover with the clinics they receive and a method to verify the receipt. The record must include the purpose of the referral, gestational age and its evidence, any findings made, action already performed and a contact method to the sending team. Each shift must have a named team to accept urgent referrals. County reviews must be able to differentiate an ambulance delay and delay in acceptance/assessment post-arrival. The inclusion of high-volume private and faith-based maternity

providers is important since women might enter and leave care across sectors. Participation must safeguard confidentiality and not use a lacking paper document to necessitate urgent care.

These suggestions can be experimented in phases. The subcounty might begin with a single facility that receives referral and multiple clinics that regularly refer women to the facility. During a period of one quarter, the teams would be able to follow up on successive referrals and categorize their result as received, redirected, declined or unknown. They were then able to choose one common, fixable issue and revisit after practice change. The time spent by the staff on each referral and report of women requested to retell or pay a second time to get an investigation would be a helpful measure of the unintended consequences. The expansion should be based on the effectiveness of the arrangement during nights and weekends in addition to the normal clinic hours. By doing so, the improvement will be visible even prior to an uncommon event like stillbirth being evaluated with sufficient accuracy.

Lastly, the county ought to assess the improvement based on similar pregnancies and well-defined outcomes. Prospective assessment might enlist residents in multiple neighbourhoods in the early stages of pregnancy and, with their consent, match clinic care with birth records and follow-up to day 28. It must cover stillbirths and births not within involved units, report missing results and list gestational age and newborn weight independently. The previous obstetric history, multiple pregnancy, clinical risk and time available to receive care should be considered in the analyses. Women who have transferred, missed visits or suffered loss would be interviewed to give an explanation on patterns that cannot be explained on a register. The best indicator of improvement would be that more women will get timely intervention when a risk is identified, and more babies will get the right care when their mothers initially made an appointment.

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