

Operations Research Study 1: **Diagnosis and Management of Reproductive and Maternal Health Morbidities in Northeast Syria (NES)**

May 2024

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الدراسة الأولى

تشخيص وتدبير الأمراض المتعلقة بالصحة الإنجابية وصحة الأمومة في شمال شرق سوريا

A summary is provided in Arabic (Page 3 Short Summary, Pages 7-9 full Summary)
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Please quote this Paper as:

H Al Daher, M Al Dabgh, D Khalid, N van den Broek. HERNES Program – Diagnosis and Management of Reproductive and Maternal Health Morbidities in Northeast Syria (NES) Operations Research Paper, May 2024. (correspondence: nvdbroek@btinternet.com)

Short Summary

This study assesses the quality of care provided to women with reproductive or maternal morbidities in Northeast Syria (NES) through case-note reviews.

The findings reveal a substantial burden of morbidity, emphasizing the need for comprehensive health services including prenatal and postnatal care, reproductive health services, and management of infections and other gynaecological problems. However, compliance provision of essential care components for history taking, clinical examination, diagnostic investigations performed, and, management was low, with overall only 28.4% compliance across the four areas. Compliance was lowest in critical areas such as history taking (24.6%) and diagnostic investigations (20.6%). This resulted in inconsistent and poor availability of essential information needed for diagnosis and treatment decision. Recommendations were co-developed and include improving patient documentation processes, disseminating clinical guidelines, emphasizing the need for comprehensive clinical examinations, reviewing diagnostic laboratory capacity, and promoting rational medication use.

The findings of this study underscore the importance of enhancing healthcare infrastructure and practices to improve the quality of care for women's reproductive and maternal health in NES.

ملخص قصير

تُقيّم هذه الدراسة جودة الرعاية المقدمة للنساء اللواتي لديهن امراض متعلقة بالأُمومة و الصحة الانجابية في شمال شرق سوريا من خلال مراجعات اضاير المرضى.

وتكشف النتائج عن عبء كبير من المراضة، مما يؤكد الحاجة إلى خدمات صحية شاملة بما في ذلك الرعاية قبل الولادة وبعدها، وخدمات الصحة الإنجابية، و تدبير العدوى وغيرها من مشاكل أمراض النساء. ومع ذلك ، كان الامتثال لمكونات الرعاية الأساسية لأخذ القصة المرضية ، والفحص السريري ، والاستقصاءات التشخيصية ، والتدبير منخفضا ، حيث بلغ إجمالي الامتثال 28.4٪ فقط عبر المجالات الأربعة. كان الامتثال هو الأدنى في المجالات الحرجة مثل أخذ القصة المرضية (24.6٪) والاستقصاءات التشخيصية (20.6٪). وقد أدى ذلك إلى عدم اتساق وضعف توافر المعلومات الأساسية اللازمة للتشخيص وقرار العلاج. تم تطوير التوصيات بشكل مشترك وتشمل تحسين عمليات توثيق الحالات المرضية ، ونشر المرشحات السريرية ، والتأكيد على الحاجة إلى فحوصات سريرية شاملة ، ومراجعة قدرات المختبرات التشخيصية ، وتعزيز الاستخدام الرشيد للأدوية.

تؤكد نتائج هذه الدراسة على أهمية تعزيز البنية التحتية للرعاية الصحية وممارساتها لتحسين جودة الرعاية الصحية للصحة الإنجابية وصحة الأم في شمال شرق سوريا.

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Summary

Background

More than 50% of all consultations at healthcare facilities across Northeast Syria (NES) are for women reporting ill-health related to reproductive and maternal health. This suggests that there is a significant burden of morbidity for women living in NES. To prevent, identify and treat morbidity, it is important that all women and their babies have access to, and availability of a range of health services that include care during and after pregnancy and birth, reproductive health services including contraception, prevention, identification, and treatment of infections including Sexually Transmitted Infections (STI), miscarriage and other gynaecological problems. For care to be effective it must be evidence-based and of good quality.

Methods

Case-note reviews were undertaken for 7 reproductive or maternal morbidities including i) Urinary Tract Infection (UTI) during Pregnancy, ii) Anaemia during Pregnancy, iii) Reproductive Tract Infection, iv) Puerperal Infection or Sepsis a) after vaginal delivery, and b) after Caesarean Section (CS), v) Miscarriage/Abortion, and vi) Dysmenorrhoea. For each patient, an assessment was made of the completion of a minimum set of expected care components to have been provided and recorded as part of history taking, clinical examination, investigations, and diagnostic tests as well as management of the morbidity. Data were analysed using descriptive statistics including percentage compliance with provision of expected components.

Findings

Analysis of Health Information System (HIS) data showed that for 51 healthcare facilities (Hospitals, CPHC, PHC and Mobile Health Units) across NES for 12 months (2023) there were 137,335 consultations for the selected morbidities with the most frequent being for 1) Reproductive Tract Infections (64,857 consultations), 2) Dysmenorrhoea (34,065) and 3) Urinary Tract Infection in Pregnancy (17,530)

For this study, a total of 1,158 case notes were reviewed from 9 healthcare facilities across NES including from 5 large Comprehensive Primary Health Care Centres (CPHC) and 4 Hospitals. Compliance with provision of essential care components was overall 28.4% across all 163 care components assessed for the 7 Morbidities. For specific components this was (in ascending order) a mean (range) compliance of 20.6% (0.0%-76.1%) for diagnostic investigations; 24.6% (1.7%-85.6%) for history taking; 32.2% (0.0%-60.7%) for clinical examination; and 36.1% (13.7%-85.2%) for management components.

All case notes did include some components of history taking relevant to the patient's presenting condition but there was no consistent recording of essential information needed to decide on subsequent examination and investigations that might be required, nor to determine a differential diagnosis.

Just over half of all patients had vital signs measured and recorded (56.0% blood pressure, 53.5% pulse rate and 53.2% temperature) but there was no or minimal record of clinical examinations such as abdominal palpation, speculum examination, or bi-manual pelvic examination even where this was essential to establish a diagnosis.

An underlying cause of the presenting complaint/illness and rationale for treatment was least available for cases of Dysmenorrhoea (14.1%) and was only documented in 42.1% of cases of puerperal sepsis or infection after vaginal birth or CS. However, the type of miscarriage (and therefore management needed) was established and documented in 69.1% of cases.

Simple diagnostic investigations are often not available and/or are not carried out. For anaemia in pregnancy (25.1%) a full blood count was carried out in 25.1% of cases only. For other morbidities this was done in between 3.0%-9.5% of patients. For cases diagnosed and treated as urinary tract infection, a urine examination was done in 40.7% (dipstick) to 42.4% (microscopy) with culture and sensitivity testing of urine done in 2.4% of cases only. For other morbidities urine examination was done in only 0.5% - 14.4% of cases where this was needed. (Rapid) diagnostic tests for reproductive tract infections were used in <5%, speculum examination was done in <10%, and treatment with antibiotics was presumptive. Assessment of ferritin to assess iron deficiency for anaemia in pregnancy is not available or used (0.0%).

An ultrasound scan (most often abdominal) is the most frequently used diagnostic investigation overall but is sometimes 'overused' e.g. 76.1% of women with a UTI had an abdominal ultrasound scan - presumably to exclude other pathology rather than to confirm an infection - and, in other cases, an ultrasound scan is available but not correctly used e.g. only 51.7% of patients with miscarriage had an ultrasound scan and only 37.9% of patients with dysmenorrhoea.

For management components the highest compliance was for recording of treatment prescribed with an average (range) of 72.1% (62.6% - 82.5%). It was noted however that most patients were prescribed multiple medications (most frequently including multiple antibiotics). Information on follow up and referral was less well documented (16.1% and 21.6% respectively)

Discussion and Recommendations

This study for the first time examines the quality of care received by women attending for reproductive or maternal morbidities at CPHC and Hospital levels in the NES. A representative sample of case notes was available for review to assess which essential components of care for 7 key morbidities had been provided. The findings of this study were shared and discussed with a wide group of stakeholders including representatives (clinical and non-clinical) from all participating Partners during a dissemination workshop in NES. This led to the development of recommendations to improve practice including to:

- Improve the infrastructure and process for patient documentation. Ensure patients have case notes which are correctly archived and available during consultation and follow up.
- Disseminate the available clinical guidelines widely and across all sectors (NGO supported, Health Authority, Private sectors) in print and on-line ensuring these are available to all healthcare providers across the NES.
- Re-emphasize the importance of conducting a full clinical examination for each patient including taking the temperature, abdominal palpation, speculum, and bi-manual pelvic examination and ensure the healthcare facility environment supports this (examination couch, good light source, instruments, screens for privacy).
- Conduct a review of laboratory diagnostic capacity in NES to assess which investigations can be done where and the cost to the patients for these if only available in the private sector.
- Support a more rational use of medication especially antibiotics with monitoring of adherence to clinical guidelines including for the use of prophylactic antibiotics during CS, ensuring diagnostic criteria are met for infection and puerperal sepsis, reproductive tract infections and urinary tract infections.

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ملخص

خلفية البحث

أكثر من 50٪ من جميع الاستشارات في مرافق الرعاية الصحية في جميع أنحاء شمال شرق سوريا مخصصة للنساء اللواتي يُبلّغن عن أمراض المرتبط بالصحة الإنجابية وصحة الأم. وهذا يشير إلى وجود عبء كبير من المراضة على النساء اللائي يعشن في شمال شرق البلاد. للوقاية من المراضة وتحديد علاجها، من المهم أن تحصل جميع النساء وأطفالهن على مجموعة من الخدمات الصحية التي تشمل الرعاية أثناء الحمل والولادة وبعدهما، وخدمات الصحة الإنجابية بما في ذلك منع الحمل، والوقاية، وتحديد، وعلاج العدوى، بما في ذلك الأمراض المنقولة جنسياً، والإجهاض وغيرها من مشاكل أمراض النساء. لكي تكون الرعاية فعالة، يجب أن تكون قائمة على الدليل وذات نوعية جيدة.

المنهجية

تم إجراء مراجعات للأضابير ل 7 امراض متعلقة بصحة الام و الصحة الانجابية بما في ذلك (1) عدوى المسالك البولية أثناء الحمل، (2) فقر الدم أثناء الحمل، (3) عدوى الجهاز التناسلي، (4) عدوى النفاس أو الإنتان (أ) بعد الولادة المهبليّة، و (ب) بعد العملية القيصرية، (5) الاسقاط، و (6) عسرة الطمث. وأجري تقييم لكل مريض لاستكمال الحد الأدنى من مجموعة مكونات الرعاية المتوقعة التي تم توفيرها وتسجيلها كجزء من أخذ القصة المرضية والفحص السريري والاستقصاءات والاختبارات التشخيصية وتدبير الحالة المرضية. تم تحليل البيانات باستخدام إحصاءات وصفية بما في ذلك النسبة المئوية للامتثال لتوفير المكونات المتوقعة.

النتائج

أظهر تحليل بيانات نظام المعلومات الصحية أنه بالنسبة ل 51 مرفقاً للرعاية الصحية (المستشفيات، ومراكز الرعاية الصحية الأولية الشاملة، ومراكز الرعاية الصحية الأولية، والوحدات الصحية المتنقلة) في جميع أنحاء شمال شرق سوريا على مدار 12 شهراً (2023) كانت هناك 137,335 استشارة طبية للأمراض المختارة مع أكثرها شيوعاً في (1) عدوى الجهاز التناسلي (64,857 استشارة)، (2) عسرة الطمث (34,065) و (3) عدوى المسالك البولية أثناء الحمل (17,530)

وتمت مراجعة ما مجموعه 1,158 اصابة من 9 مرافق للرعاية الصحية في جميع أنحاء شمال شرق سوريا، بما في ذلك من 5 مراكز كبيرة للرعاية الصحية الأولية الشاملة و 4 مستشفيات. بلغ الامتثال لتوفير مكونات الرعاية الأساسية بشكل عام 28.4٪ في جميع مكونات الرعاية البالغ عددها 163 والتي تم تقييمها ل 7 أمراض. بالنسبة لمكونات محددة، كان هذا (بترتيب تصاعدي) متوسط (نطاق) امتثال بنسبة 20.6 ٪ (0.0 ٪ - 76.1 ٪) للاستقصاءات التشخيصية؛ 24.6 ٪ (1.7 ٪ - 85.6 ٪) لأخذ القصة المرضية؛ 32.2 ٪ (0.0 ٪ - 60.7 ٪) للفحص السريري؛ و 36.1 ٪ (13.7 ٪ - 85.2 ٪) لمكونات تدبير الحالة المرضية.

تضمنت جميع الاضابير بعض مكونات القصة المرضية ذات الصلة بحالة المريضة الحالية ولكن لم يكن هناك تسجيل متسق للمعلومات الأساسية اللازمة لاتخاذ قرار بشأن الفحص والاستقصاءات اللاحقة التي قد تكون مطلوبة، وبالتالي لتحديد التشخيص التفريقي.

كان لدى ما يزيد قليلا عن نصف جميع المرضى علامات حيوية تم قياسها وتسجيلها (56.0٪ ضغط دم و 53.5٪ معدل نبض و 53.2٪ درجة حرارة) ولكن لم يكن هناك سجل أو الحد الأدنى من الفحوصات السريرية مثل جس البطن أو الفحص بالمنظار-الفحص النسائي / فحص الحوض الثنائي المشترك بالجس حتى عندما كان ذلك ضروريا لوضع التشخيص. كان السبب الكامن وراء الشكاية المرضية والأساس المنطقي للعلاج أقل ما يكون متاحا لحالات عسر الطمث (14.1٪) وتم توثيقه فقط في 42.1٪ من حالات الإنتان النفاسي بعد الولادة المهبلية أو القيصرية. لكن، تم تحديد نوع الإسقاط (وبالتالي الحاجة إلى التدبير) وتوثيقه في 69.1٪ من الحالات.

غالباً ما تكون الاستقصاءات التشخيصية البسيطة غير متاحة و/أو لا يتم إجراؤها. بالنسبة لفقر الدم أثناء الحمل (25.1٪) تم إجراء تعداد دم كامل في 25.1٪ من الحالات فقط. بالنسبة للأمراض الأخرى تم إجراء ذلك في ما بين 3.0٪ إلى 9.5٪ من المرضى. بالنسبة للحالات التي تم تشخيصها وعلاجها على أنها عدوى المسالك البولية، تم إجراء فحص البول في 40.7٪ (الغميسة) إلى 42.4٪ (الفحص المجهرى) مع إجراء اختبار الزرع والتحسس للبول في 2.4٪ من الحالات فقط. بالنسبة للأمراض الأخرى تم إجراء فحص البول في 0.5٪ - 14.4٪ فقط من الحالات التي كانت هناك حاجة لذلك. تم استخدام الاختبارات التشخيصية (السريعة) لالتهابات المسالك التناسلية في أقل من 5٪، وتم إجراء الفحص بالمنظار-الفحص النسائي في أقل من 10٪، وكان العلاج بالمضادات الحيوية افتراضياً. لم يتوفر أو يستخدم تقييم الفيريتين لتقييم نقص الحديد لفقر الدم أثناء الحمل (0.0٪).

الفحص بالموجات فوق الصوتية (غالباً البطن) هو الاستقصاء التشخيصي الأكثر استخداماً بشكل عام ولكن في بعض الأحيان يتم "الإفراط في استخدامه"، على سبيل المثال، 76.1٪ من النساء المصابات بالتهاب المسالك البولية خضعن لفحص بالموجات فوق الصوتية في البطن - من المفترض أن يستبعد الأمراض الأخرى بدلا من تأكيد العدوى - وفي حالات أخرى، يتوفر الفحص بالموجات فوق الصوتية ولكن لا يتم استخدامه بشكل صحيح، على سبيل المثال، كان 51.7٪ فقط من المرضى الذين يعانون من الإسقاط قد خضعوا لفحص بالموجات فوق الصوتية و 37.9٪ فقط من المرضى الذين يعانون من عسر الطمث.

بالنسبة لمكونات تدبير الحالة المرضية، كان أعلى امتثال لتسجيل العلاج الموصوف بمتوسط (نطاق) 72.1٪ (62.6٪ - 82.5٪). ومع ذلك، لوحظ أن معظم المرضى وصفت لهم أدوية متعددة (بما في ذلك المضادات الحيوية في أغلب الأحيان). كانت المعلومات المتعلقة بالمتابعة والإحالة أقل توثيقاً (16.1٪ و 21.6٪ على التوالي)

المناقشة والتوصيات

تبحث هذه الدراسة لأول مرة في جودة الرعاية التي تتلقاها النساء اللواتي يحضرن بأمراض تتعلق بصحة الأم و الصحة الانجابية على مستوى مراكز الرعاية الصحية الأولية الشاملة والمستشفيات في شمال شرق سوريا. وأُنِيت عينة تمثيلية من الاضابير للاستعراض لتقييم المكونات الأساسية للرعاية ل 7 حالات مرضية رئيسية تم تقديمها. تمت مشاركة نتائج هذه الدراسة

ومناقشتها مع مجموعة واسعة من أصحاب الشأن بما في ذلك ممثلين (مقدمي الخدمات الطبية و غيرهم) من جميع الشركاء المشاركين خلال ورشة عمل للنشر في شمال شرق سوريا. وأدى ذلك إلى وضع توصيات لتحسين الممارسة بما في ذلك ما يلي:

- تحسين البنية التحتية وعملية التوثيق الطبي. تأكد من أن المرضى لديهم اضاير يتم أرشفتها بشكل صحيح ومتاحة أثناء الاستشارة والمتابعة.
- نشر المرشحات السريرية المتاحة على نطاق واسع وعبر جميع القطاعات (المدعومة من المنظمات غير الحكومية ، وهيئة الصحة ، والقطاعات الخاصة) في شكل مطبوع وعلى الإنترنت لضمان إتاحتها لجميع مقدمي الرعاية الصحية في جميع أنحاء شمال شرق سوريا.
- إعادة التأكيد على أهمية إجراء فحص سريري كامل لكل مريضة بما في ذلك قياس درجة الحرارة ، وجس البطن ، والفحص بالمنظار-الفحص النسائي ، وفحص الحوض الثنائي المشترك بالجنس والتأكد من أن بيئة مرفق الرعاية الصحية تدعم ذلك (سرير الفحص ، منبع ضوئي جيد ، الأدوات ، السواتر للخصوصية).
- إجراء مراجعة للقدرات التشخيصية المختبرية في شمال شرق سوريا لتقييم الفحوصات التي يمكن إجراؤها وأين والتكلفة التي يتحملها المرضى إذا كانت متوفرة فقط في القطاع الخاص.
- دعم استخدام أكثر عقلانية للأدوية وخاصة المضادات الحيوية مع مراقبة الالتزام بالمرشحات السريرية بما في ذلك استخدام المضادات الحيوية الوقائية أثناء العملية القيصرية ، وضمان استيفاء معايير التشخيص للعدوى والإنتان النفاسي والتهابات الجهاز التناسلي والتهابات المسالك البولية.

Background

To prevent, identify and treat morbidity among women of reproductive age, it is important that all women and their babies have access to, and availability of a range of health services that include antenatal, intrapartum, and postnatal care, newborn care, and child health services. In addition, women require access to reproductive health services including family planning (contraception services), prevention, identification, and treatment of Sexually Transmitted Illnesses (STI), services that address gynaecological problems and care for women who experience gender-based violence (GBV). This is described as a ‘Continuum of Care.’¹ For care to be effective it must be evidence-based and of good quality.²

There are no current population-based estimates regarding prevalence of obstetric or gynaecological morbidity in Syria or in the NES specifically. However, programme reports indicate that over 50% of consultations at Primary Health Centres (PHC) and Comprehensive PHC across the NES are for women reporting ill-health related to reproductive and maternal health. For some conditions (morbidity recorded at healthcare facility level) several consultations may be made in a single year for the same complaint (Supplementary Table 1).^{3,4}

This suggests that there is a significant burden of reproductive and maternal morbidity for women living in NES and that existing health services are not able to meet this need.

Based on a review of available data before the study commenced^{3,5} and after consultation with midwives and obstetrician-gynaecologists (15 midwives and 5 obstetrician-gynaecologists) working in NES 7 morbidities were identified through consensus building to be those for which consultations were most frequently sought by women:

- Urinary Tract Infection (UTI) during Pregnancy
- Anaemia during Pregnancy
- Reproductive Tract Infection (also termed ‘Vaginitis’ in NES context)
- Puerperal Infection/Sepsis a) after vaginal delivery and b) after Caesarean Section
- Miscarriage/Abortion
- Dysmenorrhoea

As part of the study, data for 2023 were obtained from Partners’ health information systems (HIS) including for 5 Partners supporting 51 health care facilities (4 Hospitals, 15 CPHC, 23 PHC

¹ The Partnership for Maternal, Newborn and Child Health. Essential Interventions, Commodities and Guidelines for Reproductive, Maternal, Newborn and Child Health. 2011, Geneva, Switzerland.

² WHO 2016 Standards for improving quality of maternal and newborn care in health facilities. Available at <http://who.int>

³ HERNES 2 Health Recovery in Northeast Syria Project. Final Narrative Report August 2021 – January 2023

⁴ Expertise France - Situation Analysis prepared by N van den Broek October 2022

⁵ HWG data on service access and provision 2022/2023

and 9 mobile clinics). This indicates that there were 137,335 consultations for the 7 morbidities identified above with the highest number for Reproductive Tract Infections (64,857) followed by Dysmenorrhea (34,065) and Urinary Tract Infection in Pregnancy (17,530). (Supplementary Table 2)

At PHC, CPHC and Hospital level, services are expected to be in place to address a range of morbidities with the first (and sometimes only) point of contact being the midwife.⁶ Women may be referred for specialist care provided by obstetrician-gynaecologists working in NES in the public sector, in hospitals supported by international NGOs, or in the private sector.

Although there is generally a high number of women of reproductive age attending for care at PHC, CPHC and Hospitals across NES, there have been no previous studies to assess the quality or effectiveness of the care provided.

There are anecdotal reports that a diagnosis is frequently made based on clinical symptoms only, and there is limited use of examination and diagnostic tests used to establish a diagnosis and development of a rational management plan including with regards to the prescription of drugs.

Clinical Guidelines for the diagnosis and management of ill-health during and after pregnancy have been developed and agreed through consultation with the NES RMNCH sub Working Group. These include Guidelines for diagnosis and management of anaemia during pregnancy as well as infections and puerperal sepsis.⁷ Similarly, guidelines for abnormal vaginal discharge, miscarriage and dysmenorrhoea are under development.

The Objective of this study was to review the diagnosis and management of reproductive and maternal health morbidity as provided at CPHC and Hospitals in NES. This was expected to provide information regarding compliance with the agreed clinical guidelines as well as identify gaps in service delivery that need to be addressed.

Research Questions Developed

Main Research Question

- Is the diagnosis and management of reproductive and maternal morbidity in line with clinical guidelines?

⁶ Expertise France - Essential Health Services Package (EHSP) for Northeast Syria (NES) focused on Reproductive Maternal Newborn and Child Health (RMNCH) prepared by N van den Broek July 2022

⁷ Clinical Guidelines for Maternal and Newborn Health - Northeast Syria (NES) 2023. Expertise France ISBN 978-9922-21-446-7 (Translated into Arabic)

Additional Research Questions

- What is the number of consultations for the selected morbidities?
- Are there case definitions in place for reproductive and maternal morbidity and are these consistently used.
- How are reproductive and maternal morbidities diagnosed – are the appropriate examinations carried out and are the appropriate diagnostic tests used by healthcare providers to establish a diagnosis?
- Is there an appropriate management plan?
- Is there a rational and appropriate use of drugs?

Methods

A retrospective case note analysis was conducted for 7 pre-identified reproductive and maternal morbidities for which women see care at CPHCs and Hospitals in NES. In total 5 CPHCs and 4 Hospitals were opportunistically selected based on patient load and interest to participate in the study (opportunistic selection and including the largest Maternity Hospital in NES). All included healthcare facilities are under the management of an international or national NGO.

Sample size

At CPHC level a minimum of 20 cases and at Hospital level a minimum of 25 cases were to be identified for each of the seven morbidities. This provided an estimated sample of 200 case notes for each morbidity (100 seen at CPHC level at 5 CPHC with 100 seen at Hospital level at 4 Hospitals)

Cases for each morbidity were identified from the register (paper or electronic) at each healthcare facility. The number of cases required were identified retrospectively and included consecutively over time. Using the date of visit and the patient identification number, the case notes for each patient were then obtained from the records office/archive and reviewed using a specifically developed data-extraction form. All case notes were identified and reviewed between 6 July and 5 October 2023.

Data collection

A data-extraction form was developed for each morbidity based on evidence-based guidelines for diagnosis and management contextualised to the NES.⁷ In this way a designated data extraction form was developed for each of the following morbidities:

- Urinary Tract Infection (UTI) during Pregnancy
- Anaemia during Pregnancy
- Reproductive Tract Infection

- Puerperal Infection/Sepsis after vaginal delivery
- Puerperal Infection/Sepsis after Caesarean Section
- Miscarriage/Abortion
- Dysmenorrhoea

For each morbidity, the data extraction form included a range of expected components to have been recorded for each aspect of the consultation for each of the seven identified morbidities. This included:

- a) patient information and characteristics
- b) whether the relevant questions had been asked as part of taking the patient's history,
- c) whether the relevant examinations had been carried out,
- d) which - if any – of the required investigations or diagnostic tests had been carried out, and,
- e) the management provided to the patient including any medication prescribed, follow up arranged or referral made.

Questions were answered with a YES/NO. No patient clinical information was extracted except for 1) the haemoglobin level - if measured - in case of a diagnosis of anaemia in pregnancy, 2) the temperature - if measured - in case of infection, and 3) the number of previous miscarriages in cases of miscarriage/abortion. Data extraction forms were first developed in English and then translated into Arabic. (*Data extraction forms are available on request*)

For each site 2 midwives and a focal point were trained in the use of the data collection tool via a 1-day training workshop. The data collection tools (for each morbidity) were piloted at one of the participating hospitals after which minor changes were made to language to facilitate consistent understanding of some medical terms in Arabic. A paper-based data collection system was used. A minimum of 10% of completed data forms were checked by each focal point. Copies of completed data forms were then transferred (password protected) by phone to the central office (phone images were deleted by the sender and receiver after receipt of completed forms was acknowledged). A pre-designed data entry form was developed Microsoft Excel and Kobo Toolbox⁸, and data were entered and cleaned by a dedicated research assistant (checking and double checking of data entry).

Data analysis

⁸ Kobo Toolbox is a data collection, management, and visualization platform used globally for research and social good. <https://www.kobotoolbox.org/>

Descriptive data analysis was used to summarise the findings. The degree of compliance with expected components of taking a history, examination, diagnosis, and management was calculated as a percentage score using equal weighting for each of the components.

Ethical considerations

Data entry and storage were on a dedicated password protected computer. Names of patients were not recorded with only patient identification numbers used on data collection forms and once data was checked and cleaned this information was deleted from the data base. Names of healthcare facilities were coded. All data collection forms were destroyed (burnt or shredded) once the data was cleaned and the data base completed. As this was essentially an audit of practice using a retrospective case note review, ethical clearance was not required. The funding agency was not involved in the design and conduct of the study. Midwives completing the case note review were compensated with 1\$ per case note review.

Results

Availability of Case Notes for Review

In total 1,158 case notes were obtained and reviewed including from 9 healthcare facilities (5 CPHC with 754 cases – 65% of total and 4 Hospitals with 404 cases – 35% of total). Not all participating healthcare facilities had registered cases and/or case notes available for all morbidities; 1 hospital and CPHC had no case notes available for puerperal sepsis/infection after either CS or vaginal birth and the CPHC also had no records of consultations for reproductive tract infections. The expected sample size +/- 10% (180-220) was obtained for four morbidities. For puerperal sepsis/infection after vaginal birth or Caesarean Section this was obtained only if combined (181 cases) and for Miscarriage the number of case notes reviewed was 178 and just below the target sample size. ([Table 1](#)).

Table 1: Overview of Case notes reviewed.

Morbidity		Number of Cases Reviewed
1	Anaemia in Pregnancy	191
2	Caesarean Section - Puerperal Sepsis or Infection	97
3	Vaginal Delivery - Puerperal Sepsis or Infection	84
4	Dysmenorrhea	206
5	Miscarriage (Abortion)	178
6	Reproductive Tract Infection	197
7	Urinary Tract Infection in Pregnancy	205
Total		1,158

Anaemia in Pregnancy (Figure 1)

Place of Residence was the most frequently recorded (72.8%). Only 5.2% of case notes had information on age with a median (interquartile range) age for patients of 28 (23,32) years.

For 1 in 3 patients (35.6%) there was information about whether they had fatigue or other symptoms of anaemia with in general very little history being taken.

Basic clinical investigations (BP, pulse, temperature) were recorded in just over half of all patients with BP recorded the most frequently (57.1%). In more than half of cases a HB measurement was available (55.5%) with a mean (range) Hb recorded as 8.5 g/dl (2.3 g/dl to 10.5g/dl). Of the 61 women for whom Hb was available 32.8% (20/61) had severe anaemia (HB<8.0g/dl) and 9.8% (6/61) required a blood transfusion (Hb<6.0g/dl). Serum ferritin was never available.

Information on treatment prescribed was documented for 72.3% and this included blood transfusion, iron tablets and folic acid but also corticosteroids (dexamethasone, hydrocortisone) as well as antibiotics (ceftriaxone, metronidazole). There was no information on follow up for 83.2% of patients. 23 out of 191 (12%) received a follow-up appointment.

Puerperal Infection after Caesarean Section (CS) (Figure 2)

Place of residence was the most frequently recorded (99.0%). Only 13.4% of women were asked about vaginal bleeding and only 23.7% about vaginal discharge.

A speculum examination was conducted in 1% of women. Temperature was measured in 77.3% but only 11 of these had a fever (14.9% temperature >38.0 °C). There was no information on underlying cause of puerperal infection in 58.8%, in 10 women (10.3%) no underlying cause could be established and in only 1 in 4 women (25.8%) was a cause documented which was most often 'wound infection' (16/25, 64.0%).

Information on treatment given was available in 82.5% of cases. Prescribed 'antibiotics' included Amoxicillin, Azithromycin, Cefixime, Ceftriaxone, Ciprofloxacin, Gentamycin, Metronidazole and Vancomycin suggesting there is no standardised protocol in use for management.

Figure 1: Information available for each component of History taking, Examination, Investigations, and Management for Anaemia in Pregnancy (n=191, % of case notes with information available)

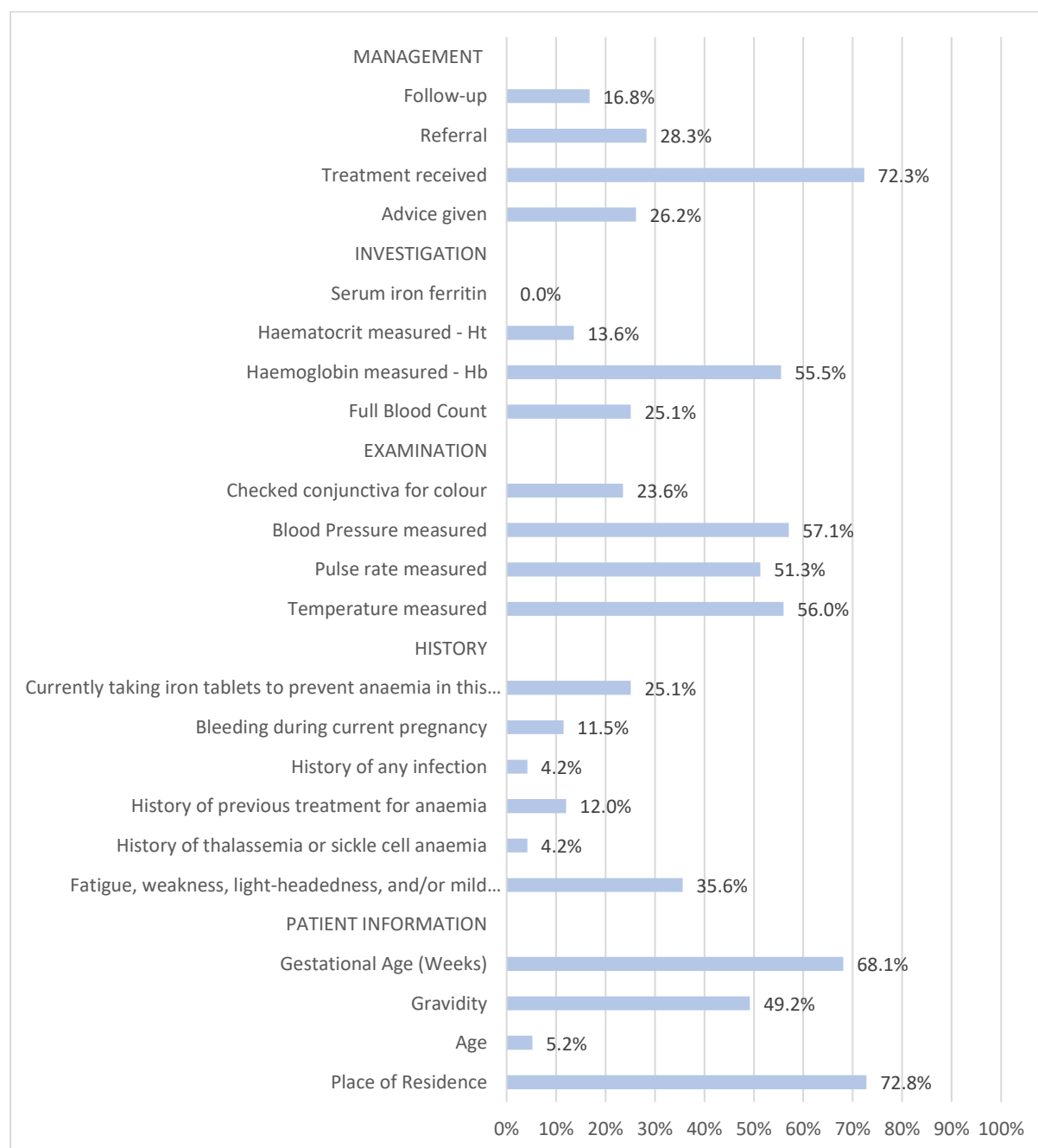
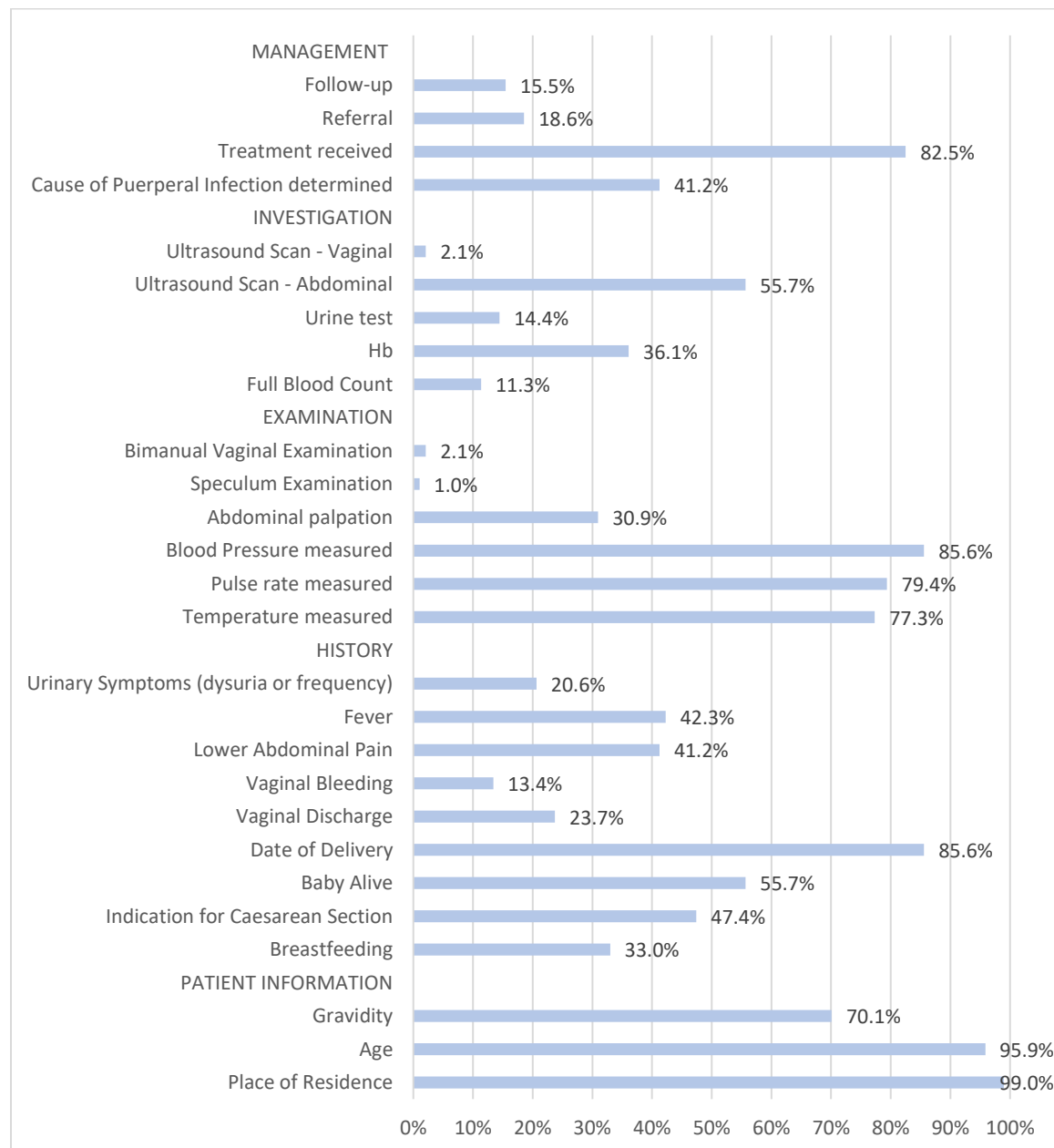


Figure 2: Information available for each component of History taking, Examination, Investigations, and Management for Puerperal Infection or Sepsis after Caesarean Section (n=97, % of case notes with information available)



Puerperal Infection or Sepsis after Vaginal Delivery (Figure 3)

Although 54.8% of patients were asked about lower abdominal pain, only 1 in 3 (34.5%) was asked about vaginal discharge and even fewer (7.1%) about vaginal bleeding.

None (0%) of the case notes had a record of conduct either a speculum or a bimanual examination. Abdominal examination was conducted in 14.3% of cases only. Temperature was measured in less than half of all patients (44.0%) with actual temperature recorded for 42.9% of the total (36 cases) for which only 11 had a fever (13.1% temperature $>38.0^{\circ}\text{C}$).

In 36 cases (42.9%) an underlying cause for the puerperal infection was recorded including most commonly 'episiotomy infection'.

Information on treatment was available in 77.4% of case notes. Management was usually a combination of drugs including often multiple antibiotics of different types (amoxycillin, metronidazole, ceftriaxone, nitrofurantoin, gentamicin,) but also clotrimazole and miconazole suggesting there was no specific protocol used. Sometimes treatment included blood transfusion suggesting multi-morbidity.

Dysmenorrhoea (Figure 4)

Dysmenorrhoea is a relatively common reason for consultation including for younger patients. The median (interquartile range) was 25 (19,32) years.

An abdominal ultrasound scan was conducted in 36.4% of women and a vaginal ultrasound in only 1.5%. Laboratory tests for sexually transmitted infection were almost never done (less than 1%). Nevertheless, information regarding an underlying cause was documented in 29 cases (14.1%) and recorded as 'no specific underlying cause established' in 27 cases, 'mental cause' and 'uterine contractions' in the remaining 2 cases.

Information on treatment was available in 62.6% of case notes. The most common prescription was for analgesics (mostly Ibuprofen) followed by antibiotics (full range) or an anti-spasmodic (including hyoscine butyl bromide). There was no record of anyone being given the combined oral contraceptive pill which is the commonest approved management of dysmenorrhoea with unknown cause.

Figure 3: Information available for each component of History taking, Examination, Investigations, and Management for Puerperal Infection or Sepsis after Vaginal Delivery (n=84, % of case notes with information available)

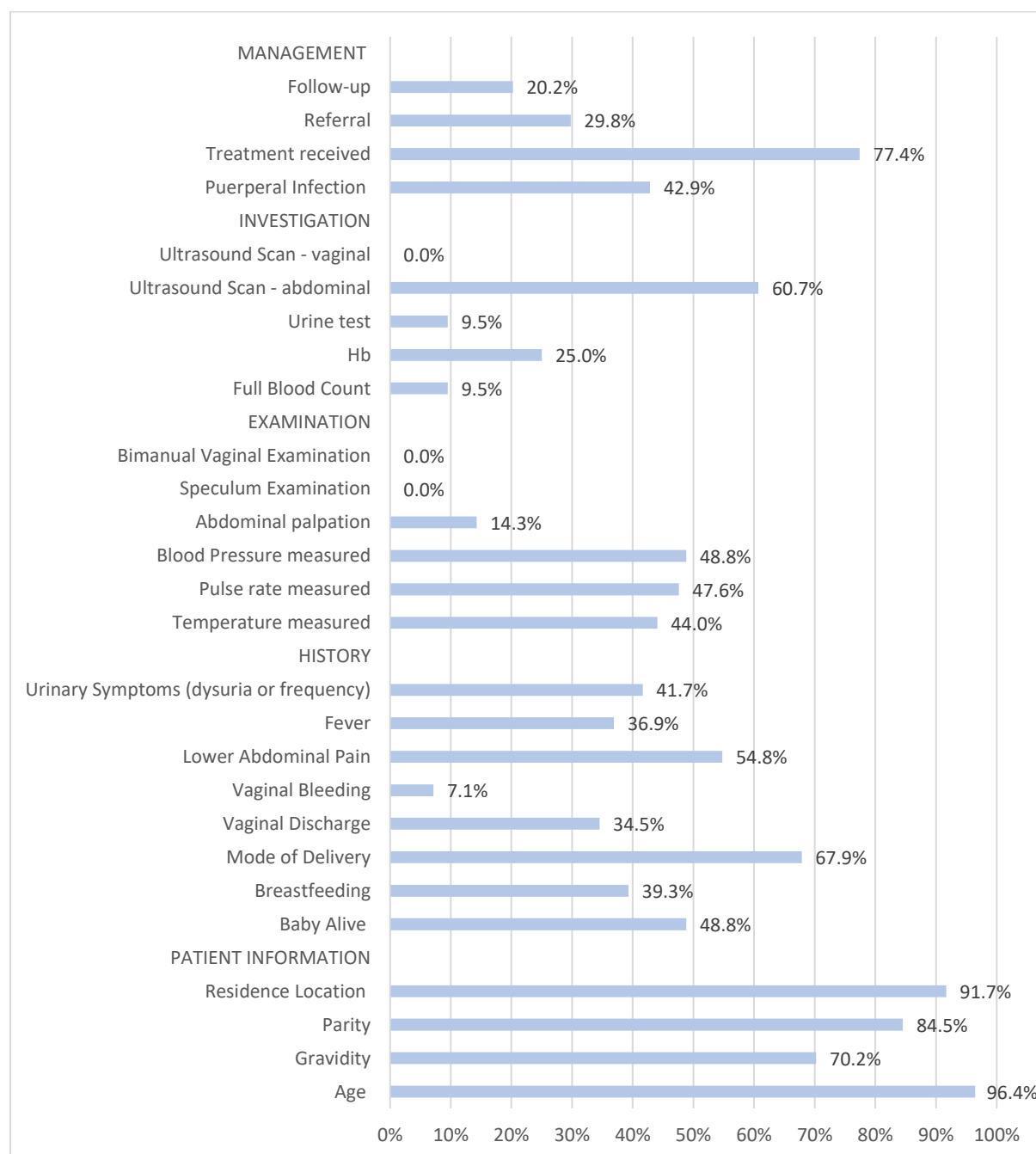
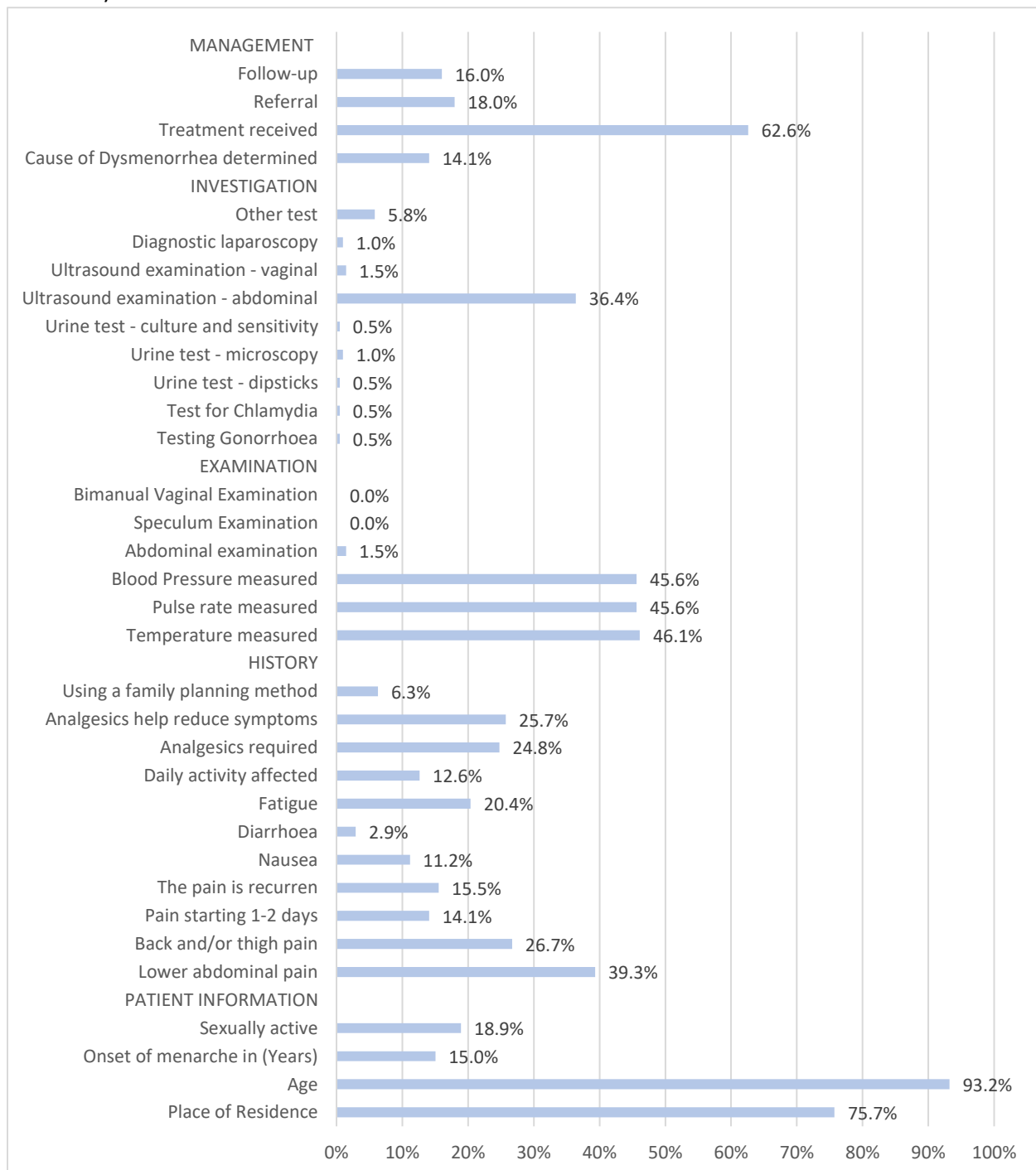


Figure 4: Information available for each component of History taking, Examination, Investigations, and Management of Dysmenorrhoea. (n=206, % case notes with information available)



Miscarriage (Figure 5)

178 cases were available for analysis. There was no information on gestational age for 71.9%. For cases for which information was available the majority (37/50, 74%) were early miscarriages (8 weeks or less) with 11 (22.0%) at 9-14 weeks and 2 were late miscarriages at 17 and 20 weeks.

A speculum examination was done in only 0.6% of patients. There was no information regarding whether an ultrasound scan had been done for 86 patients (86/178; 48.3%); 86 women (48.3%) had an abdominal ultrasound scan and 6 women (3.4%) a vaginal ultrasound scan with the total proportion having had a diagnostic scan being 51.7% (92/178). The type of miscarriage was specifically determined and recorded in 47.2% (84/178) with 53 diagnosed and recorded as an incomplete miscarriage (29.8%). In total 54/178 patients (30.3%) were recorded as having had surgical evacuation (D&C) or 'minor gynaecological surgery'. Overall information on treatment received was available in 70.2% of case notes.

Reproductive Tract Infection (Figure 6)

Consultations for reproductive tract infection and/or sexually transmitted infections are relatively common, with 197 cases for analysis. As part of the history taking 39.1% were asked about vaginal discharge, 22.8% about lower abdominal pain and 14.7% about urinary tract infections. Overall, only 1 in 10 patients were clinically examined with a speculum and/or bimanual examination done in 9.6%, and abdominal examination in 10.7% of cases. Although 50.3% of patients had an abdominal ultrasound scan only 4.1% had a pregnancy test (needed e.g. to exclude ectopic pregnancy) and less than 1% of women had a test to exclude an STI (chlamydia, gonorrhoea, syphilis, HIV, Bacterial vaginosis). Information on treatment prescribed was available in 66.5% of case notes overall. Antibiotics were the most frequently prescribed drug: 57/68 (83.8%) for inpatients and was prescribed for all outpatients (100%) including a wide range of antibiotics and combinations of these – Amoxicillin, Augmentin, Azithromycin, Cefixime, Ceftriaxone, Ciprofloxacin, Cotrimoxazole, Fluconazole, Gentamycin, Metronidazole, Miconazole and Nitrofurantoin.

Urinary Tract Infection in Pregnancy (Figure 7)

Information on gestational age was recorded in 67.8% of case notes with the majority being mid-trimester (44.6%) 16.6% were in the first trimester (1-13 weeks) and 36% in the third trimester (29-40 weeks). Regarding examination temperature was measured in 48.3% and loin tenderness (to exclude pyelonephritis) was checked in 2.0%. Urine was examined by dipstick in 40.5% of cases and by microscopy in 42.4% with only 2.4% sent for culture and sensitivity. However, 76.1% of patients had an ultrasound scan. Treatment received or prescribed was recorded in 73.2% of case notes and follow up in only 12.7%. The most common management was antibiotics (different types) followed by Paracetamol.

Figure 5: Information available for each component of History taking, Examination, Investigations, and Management of Miscarriage (n= 178, % case notes with information available)

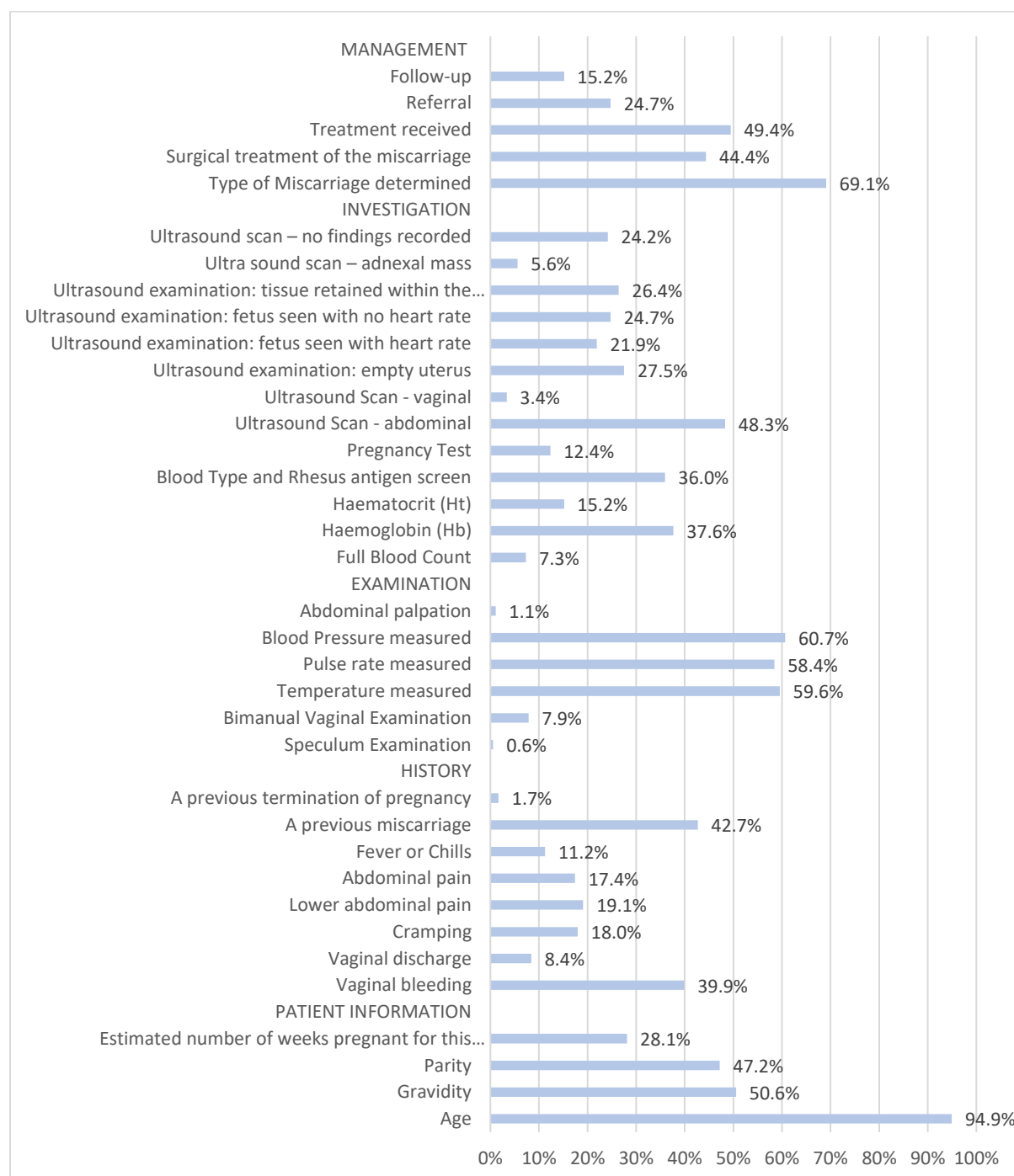


Figure 6: Information available for each component of History taking, Examination, Investigations, and Management of Reproductive Tract Infection (n= 197, % of case notes with information available)

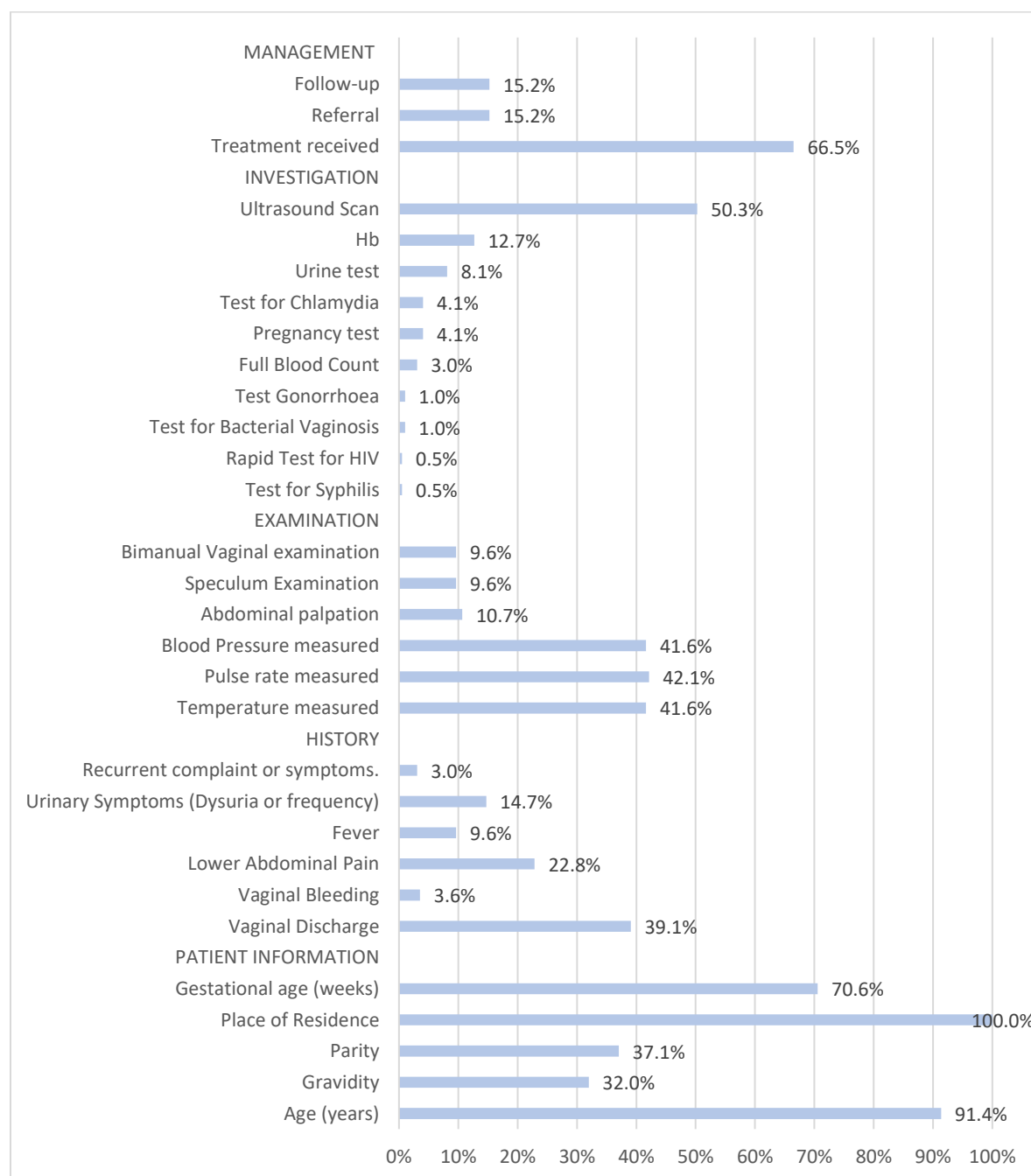
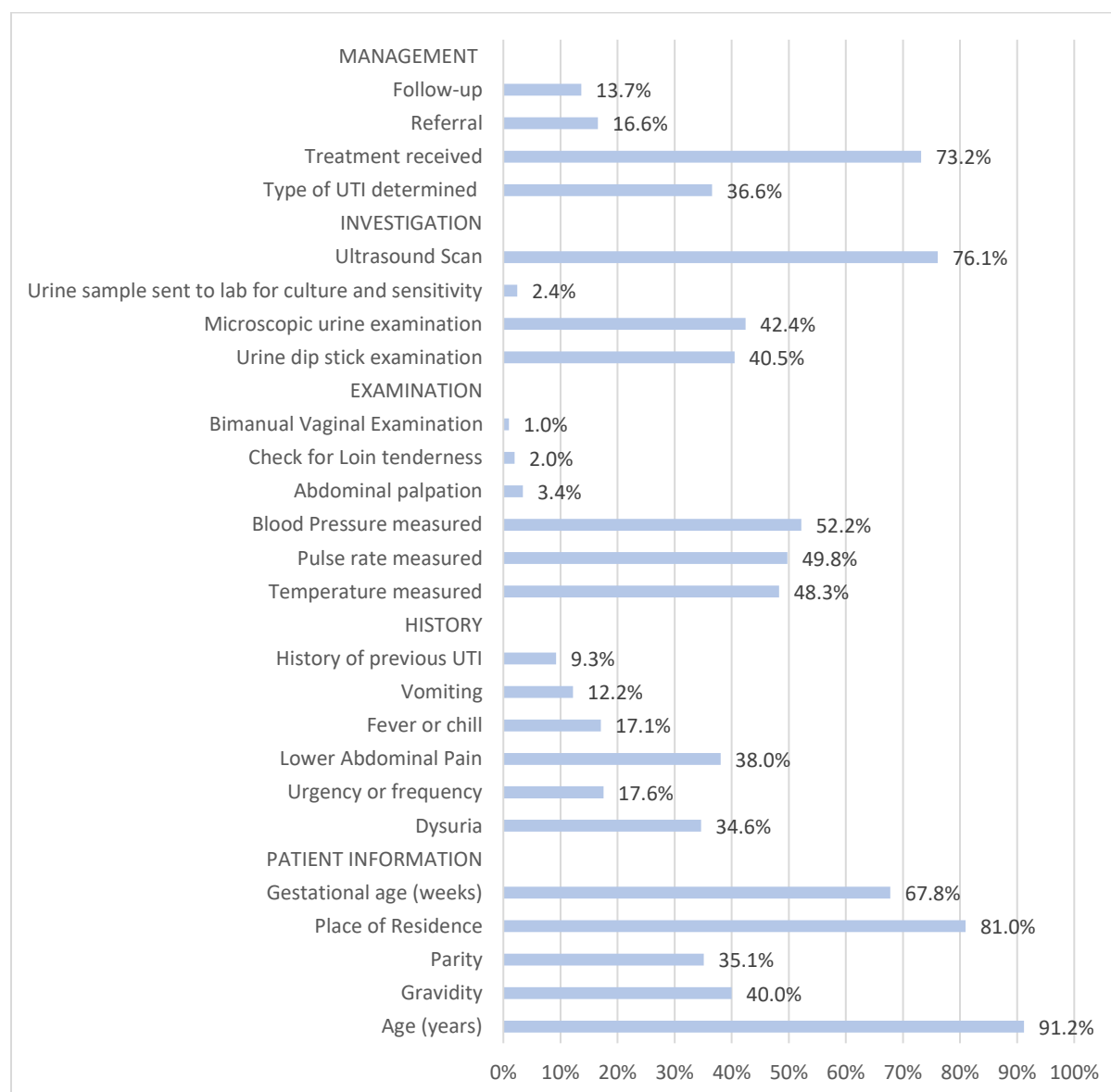


Figure 7: Information available for each component of History taking, Examination, Investigations, and Management of Urinary Tract Infection in Pregnancy (n= 205, % case notes with information available)



Compliance with Components for all Morbidities Combined

(Table 2 and Supplementary Figures 1-4)

History taking

Across all morbidities the average (range) compliance for 54 care components assessed as part of history taking was 24.6% (1.7% - 85.6%).

For urinary tract infection in pregnancy the commonest history components were whether there was lower abdominal pain (38.0%) and pain during micturition (dysuria, 34.6%). For a reproductive tract infection, the most frequently asked question was if vaginal discharge was present (39.1%). For cases of miscarriage the two commonest questions were whether there was a previous miscarriage (42.7%) and whether there was vaginal bleeding (39.9%). The largest number of components assessed (11) was for history taking in case of dysmenorrhoea with the most frequently recorded history being whether there was lower abdominal pain (39.3%)

For puerperal sepsis after vaginal delivery mode of delivery was the most frequently recorded history (67.9%) and for cases following a CS this was the number of days after delivery (85.6%). Whether or not vaginal bleeding occurred was only asked in 7.1% of cases of vaginal birth and 13.4% of caesarean sections and was the least likely component of the history to have been asked in both cases. For anaemia in pregnancy only 25.1% of women were asked if they were taking iron tablets at the time.

Clinical Examination

Across all morbidities the average (range) compliance for 40 care components assessed as part of clinical examination was 32.2% (0.0% - 70.7%).

The combined score for clinical examination with an average of 32.2% is almost wholly due to the finding that vital signs were checked in most patients – blood pressure in 55.9%, pulse rate in 53.5% and temperature in 53.3% of cases on average. In contrast important clinical examinations such as abdominal examination was carried out in 1.1% for cases of miscarriage, 1.5% for dysmenorrhoea, 10.7% for reproductive tract infection, 14.7% of cases of puerperal sepsis after vaginal delivery and 30.9% of cases after caesarean section.

Speculum examination was not carried out at all (0.0%) for puerperal infection after vaginal delivery, very rarely after puerperal infection following a CS (1.0%) or in case of miscarriage (0.6%) and in less than 1 in 10 women complaining of a reproductive tract infection/vaginitis. Similarly bimanual vaginal examination was done in only 3.4% of cases for which this was indicated.

Investigations

Across all morbidities the average (range) compliance for 47 care components assessed as part of diagnostic investigations was 20.6% (0.0% - 76.1%).

The most frequently conducted investigation was an ultrasound scan: 60.7% and 55.7% for puerperal sepsis or infection after vaginal birth and CS respectively, 37.9% for cases of dysmenorrhoea, 51.7% for cases of miscarriage and (presumably to exclude other pathology) 76.1% for cases of a urinary tract infection in pregnancy. These were mostly abdominal ultrasound scans. Only 1.5% of cases of dysmenorrhoea had a vaginal scan to investigate underlying cause.

However a urine sample for culture and sensitivity was only sent in 2.4% of cases with a urinary tract infection, a (rapid) diagnostic test for reproductive tract infections was done in less than 5% of cases, a pregnancy test was only done in 12.4% of cases of miscarriage, a full blood count was done in 11.3% of cases of puerperal sepsis after CS and 9.5% of cases after vaginal birth and puerperal sepsis/infection. A haemoglobin measurement was available for 55.5% of cases of anaemia during pregnancy.

Rapid tests for any STI were done in less than 1% of cases despite vaginal discharge being one of the commonest complaints.

Management

Across all morbidities the average (range) compliance for 22 care components assessed as part of management was 36.1% (13.7% - 82.5%).

Information regarding underlying cause or definitive diagnosis was recorded in between 14.1% (dysmenorrhoea) and 69.1% (type of miscarriage) with an average of 35.4% of cases for which this was relevant.

The main criteria considered for documentation of management included i) record of follow up (Yes/No), ii) referral had taken place (Yes/No), and iii) treatment prescribed (Yes/No and type of treatment). Information on management was least available for information regarding follow up after urinary tract infection in pregnancy (13.7%) and most frequently recorded for treatment provided in patients with puerperal sepsis/infection after CS (82.5%).

An average of 16.1% of case notes had information on follow up, and 21.6% had information regarding referral. Information on treatment given was available in 72.1% of all case notes. The average compliance across the three criteria for management was 36.1%.

Table 2: Summary data for each morbidity and for all morbidities combined for history taking, clinical examination, investigations, and management. (n= number of components, % of components for which information is available)

Morbidity	History			Examination			Investigations			Management		
	n	Range %	Mean %	n	Range %	Mean %	N	Range %	Mean %	N	Range %	Mean %
Anaemia in Pregnancy	6	4.2 - 35.6	15.4	4	23.6 - 57.1	47.0	4	0.0 - 55.5	23.6	4	16.8 - 72.3	35.9
Puerperal sepsis/infection after Caesarean Section	9	13.4 - 85.6	40.3	6	1.0 - 85.6	46.0	5	2.1 - 55.7	23.9	3	15.5 - 82.5	38.9
Puerperal sepsis/Infection after vaginal delivery	8	7.1 - 67.9	41.4	6	0.0 - 48.8	25.8	5	0.0 - 60.7	20.9	3	20.2 - 77.4	42.5
Dysmenorrhoea	11	2.9 - 39.3	18.1	6	0.0 - 46.1	23.1	12	0.5 - 36.4	3.7	3	14.1 - 62.6	32.2
Miscarriage	8	1.7 - 42.7	19.8	6	0.6 - 60.7	31.4	7	3.4 - 48.3	22.9	3	15.2 - 70.2	36.7
Reproductive Tract Infection	6	3.0 - 39.1	15.5	6	9.6 - 42.1	25.9	10	0.5 - 50.3	8.5	3	15.2 - 66.5	32.3
Urinary Tract Infection in Pregnancy	6	9.3 - 38.0	21.5	6	1.0 - 52.2	26.1	4	2.4 - 76.1	40.4	3	13.7 - 73.2	34.5
Total	54	1.7 - 85.6	24.6	40	0.0 - 60.7	32.2	47	0.0 - 76.1	20.6	22	13.7 - 82.5	36.1

Discussion

Main Findings

Across 7 reproductive and maternal morbidities 163 care components were assessed through a review of 1,158 case-notes from 9 different healthcare facilities across NES. Overall compliance with essential components of care was lowest for diagnostic investigations with a mean (range) compliance of 20.6% (0.0%-76.1%) and was highest for management components with a mean (range) compliance of 36.1% (13.7%- 82.5%).

For single components the highest overall score was for recording of treatment prescribed (82.5% in cases of puerperal sepsis/infection after CS) and lowest for investigations and clinical examination including for example a 0% compliance score for case notes containing information on whether a bimanual or speculum examination had taken place in cases of dysmenorrhoea and puerperal sepsis/infection after vaginal birth. Both examinations are usually needed to assess possible underlying pathology and/or check severity of the condition. Similarly, only 0.6% of cases of miscarriage had a recorded speculum examination which is important to assess the state of the cervix and only 1.1% had record of an abdominal examination which is needed to exclude signs of an acute abdomen for example in case of an ectopic pregnancy and to assess uterine size.

Thus, this study shows that clinical examinations such as abdominal palpation, speculum and bimanual pelvic examination are frequently not conducted even when these could be essential to establishing a diagnosis. Clinical examination requires only limited instruments and consumables (gloves, speculum) it is important to have a dedicated private space with a good light source and examination couch (including with lithotomy poles). Also carrying out a full clinical examination takes time.

An ultrasound scan is the single most frequently used diagnostic tool. This was used and recorded in 60.7% and 55.7% of cases with puerperal sepsis or infection after vaginal birth and CS respectively, 37.9% cases of dysmenorrhoea, 51.7% for cases of miscarriage, and, presumably to exclude other pathology in 76.1% of cases of a urinary tract infection in pregnancy. Thus, there is likely both under-use and over-use of ultrasound as a diagnostic investigation in this setting.

The low compliance observed for diagnostic investigations is considered to reflect the poor availability of simple point-of-care diagnostic tests such as urine dipsticks, or rapid diagnostic tests for e.g., reproductive tract infections and haemoglobin as well as a general lack of laboratory services with e.g., measurement of ferritin for cases of anaemia, a culture and sensitivity test for urinary tract infections, generally not being available in NES or only in larger hospitals or in the private sector.

Dysmenorrhoea is a frequent cause for consultation in the NES being, for the 7 morbidities studied, the second most frequently recorded condition ([Supplementary Table 2](#)). Although an 'underlying cause' was documented in 14.1% of cases - this was recorded as 'no specific underlying cause established' in almost all the cases even though there had been no full clinical examination or set of investigations conducted. Treatment was for symptoms (analgesics) and/or included a full range of antibiotics despite no clinical symptoms or signs of infection. In contrast

the combined oral contraceptive which is a first line treatment for dysmenorrhoea was never recorded as being prescribed in the case notes reviewed (0/206 case notes).

Similarly, type of UTI (lower or upper) or underlying cause of puerperal sepsis/infection after a vaginal birth or CS was documented in 4 out of 10 women only (36.6% and 42.1% of cases respectively). Despite this almost all women received antibiotics and most commonly multiple antibiotics prescribed together.

However, the type of miscarriage was established and documented in 69.1% of cases. With adequate clinical examination and simple investigations (speculum and/or bimanual pelvic examination as well as pregnancy test) and less reliance on an abdominal ultrasound scan only it would be possible to very significantly increase the proportion of cases for which type of miscarriage (and therefore treatment) would be known.

Strengths and Limitations

Our intention was to look at the number of cases documented to have attended a consultation for each morbidity e.g. in the healthcare facility records of Partner's HIS and to compare this with the number of case notes that could be found. However, we found that there is a significant lack of archiving processes and systems in place across the NES. Also, it is clear that no standard definitions for morbidities are used in the various HIS that are in use across NES. It was therefore not possible to estimate what proportion of patients accessing for care had correctly archived case-notes. However, after a further call-out to Partners (mainly international NGOs) the number of consultations documented was obtained and shows that there are around 140,000 consultations per year for the 7 morbidities studied in just 51 healthcare facilities.

There are problems with documentation including several (no central) HIS in use, differences in case definitions and incorrect case definition application, not all morbidities captured e.g. some HIS do not include puerperal sepsis/infection after vaginal birth or after CS. However overall, the data highlight a high burden of consultations reproductive and maternal morbidity among women living in NES.

The number of case-notes available allowed for in-depth analysis for each morbidity except for puerperal sepsis/infection after vaginal birth or CS. This was an unexpected finding as both conditions are reported by clinicians as occurring 'frequently.' It is likely that puerperal sepsis is 'over diagnosed' as many of the cases included in this review did not have clinical symptoms or signs to support the diagnosis e.g. most women did not have a fever.

The data presented reflect the care that has been documented. It is possible that components of care were provided but not written down and that the overall 'real-life' compliance is better than

that obtained as part of this study especially where case load is high and the amount of time a healthcare provider has with a patient is limited. However, it is commonly accepted in medical practice that ‘if it is not written down it did not happen.’

In this study components of care considered to be essential and for which data was extracted from case notes were obtained from clinical guidelines and protocols which had been developed for clinical practice in NES. However not all health care providers have received these and on-the-job training will be required to facilitate change in practice over time. All components were equally weighted in this study to provide an overall assessment of compliance and quality of care and data were not used to focus on any one specific morbidity in more detail.

Comparison was not made between CPHC and Hospital levels but is not expected to differ much with the exception that hospitals may have more advanced equipment for diagnostic investigations and are expected to have larger on-site laboratories than can be found at CPHC level.

Implications for Policy and Practice

Following a dissemination workshop with all participating stakeholders, the following recommendations were developed:

General Recommendations:

Improve patient documentation.

There is consensus that the current state of documentation of patient information is poor. Till now there has been limited or no attention given across the NES to ensuring patient case notes are available, used, securely archived, and stored, and are made available for review when the patient has a follow up visit or new consultation at the healthcare facility.

- Healthcare providers should be made aware of the need to record all patient information including regarding history taking, examination, investigations, management, referral and follow up.
- Case notes should be made available. It is considered helpful to use a standardised format e.g., with pre-determined sections for information collected as part of consultations for reproductive and maternal morbidities, consultations for antenatal- or postnatal care or family planning.
- Healthcare facilities should have dedicated infra-structure and processes in place to ensure all patient information is documented in case notes, these are archived and stored securely and are available to the healthcare provider when the patient accesses the healthcare facility.

- Documentation needs to be in place for referral including referral notes and follow up regarding outcomes of referral.

To improve Diagnosis and Management

- Ensure a full and detailed history is taken and recorded for every patient
- In addition to measurement of Blood Pressure, pulse and temperature, the health care provider should conduct a full clinical examination including abdominal examination, speculum and bimanual pelvic examination whenever indicated.
- Review the situation in NES regarding the availability and cost (to patients) of laboratory services. Ensure larger healthcare facilities have the necessary infra-structure and consumables for diagnostic tests including a laboratory space and staff. Point-of-care rapid diagnostics tests to be made available at all levels including – at a minimum – pregnancy tests, Hb tests, STI tests (syphilis, HIV) and urine dipsticks.
- Build capacity of healthcare providers to establish a differential diagnosis and an underlying cause for conditions with which the patient presents.
- Ensure focus is on prescribing drugs in accordance with the essential medicines list for NES and in line with clinical guidelines.
- Ensure a follow up visit and schedule for this is provided when needed.
- Guidelines and protocols for reproductive and maternal morbidities should be developed and/or where available be widely disseminated. Dissemination should be through the HWG, RMNCH sub WG, NGO leadership, LHA, the private sector, in-print and on-line (e.g. Telegram channel) to ensure they are available to healthcare providers in all healthcare facilities across the NES.
- Clinical audit can be conducted for morbidities to assess level of compliance with clinical guidelines.

Recommendations for specific Morbidities

• Anaemia during pregnancy:

- Conduct Haemoglobin (Hb) testing routinely for all pregnant women. This is best done at the first ANC (or booking) visit and repeated in the third trimester. In addition, for women who are treated for anaemia, a repeat Hb is required to assess if treatment is effective e.g., after ferrous sulphate treatment Hb is repeated after 2-4 weeks.
- For anaemia which does not respond to ferrous sulphate (treatment dosage) determine the cause of anemia through further laboratory investigations and/or referral if required.

- **Puerperal Sepsis or Infection after Caesarean Section or Vaginal Delivery:**

- Agree and disseminate a standardized definition and clinical criteria for the diagnosis of infection after vaginal birth or CS, and, for puerperal sepsis.
- Re-emphasize the need for a full clinical examination and appropriate investigations to be done in case of women suspected of having an infection after vaginal birth or CS or puerperal sepsis.
- Ensure adherence to evidence-based guidelines and clinical protocols for the use of antibiotics during and after vaginal birth and CS.

- **Dysmenorrhea**

- Document the age at which menstruation begins and the symptoms and signs accompanying dysmenorrhea.
- Include a measure of the extent to which daily activity is affected by dysmenorrhea.
- Conduct a full set of investigations to determine underlying cause of Dysmenorrhea including a urine test to exclude urinary tract infection, tests for reproductive tract infection and abdominal as well as vaginal ultrasound examination

- **Miscarriage/Abortion:**

- Determine the type of miscarriage/abortion when documenting the case e.g., whether complete or incomplete, threatening, or inevitable.
- Ensure the gestational age at which the miscarriage/abortion occurs is documented
- Document all investigations including any tests done and the ultrasound findings
- Distinguish between first and second trimester miscarriage, previous miscarriage, and recurrent miscarriage as this determines the subsequent management.
- Offer support, follow up the patient to debrief, and document follow-up visits.

- **Reproductive and Urinary Tract Infections**

- Avoid treating with antibiotics unless there is unmistakable evidence of infection. Conduct a full clinical examination including checking the temperature, conducting abdominal palpation, speculum examination and/or bimanual pelvic examination.
- Screen for sexually transmitted infections (STI) by conducting rapid tests which should be available for (at a minimum) syphilis and HIV (combined in one test).
- Conduct a urine examination - at a minimum using dipsticks and preferably by conducting urine microscopy. As urine culture and sensitivity is not available (except in some private laboratories) this investigation can be recommended for women with recurrent infections.

Acknowledgements

We wish to most sincerely thank all Partners for their participation in this study. We also specifically wish to thank the data collectors for their hard work. Without you this study would not have been possible.

Funding

Funding for this study was from the French Ministry of European and Foreign Affairs and the European Union as part of the HERNES III Program led by Expertise France.

Supplementary Tables and Figures

Supplementary Table 1: Indicative pattern of consultations and identified Morbidity at CPHC level ⁹

Consultations	Number of consultations per person	Most frequent Obstetric Morbidities (n)	Most frequent Gynaecological Morbidities
Total number of consultations at clinic in 1 month 8,400	Total number of patients = 3,376 ¹⁰ i.e. 2.5 consultations per patient/months	iron deficiency anaemia (299) plus postnatal anaemia (44)	bacterial vaginitis (200) fungal vaginitis (195)
Number of Gynaecology consultations 1669 (19.7%)	Number of patients = 707 i.e. 2.4 consultations per patient/month	bacterial vaginitis in pregnancy (103)	other menstrual disorders (79)
Number of Maternity consultations 1998 (23.8%)	Number of patients = 462 i.e. 4.3 consultations per patient/month	vomiting in pregnancy (111)	functional ovarian cyst /Polycystic ovary (24),
(Including 76 births)		Others (111)	'Checking ovulation' (19) Others (154)

⁹ Situation Analysis Report January 2021 - obtained from HIS monthly spreadsheet for a large CPHC.

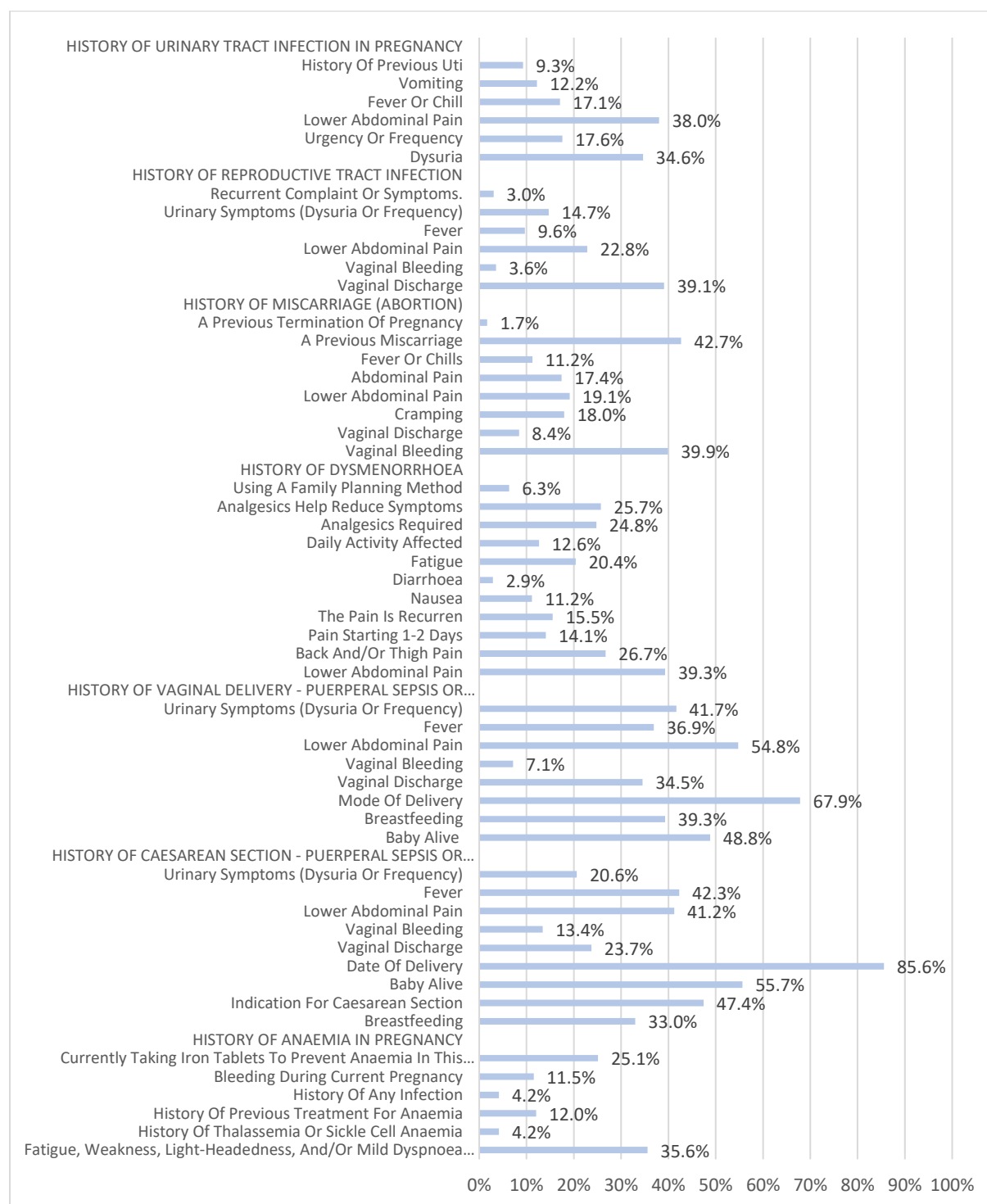
¹⁰ Although recorded as 'total patients' in the HIS at time of assessment this may not consider that a woman has more than one morbidity identified – in which case the most important can be recorded in the HIS or space can be identified for recording multiple morbidities (recommended). At time of assessment, under 'gynaecology' and 'maternity' the 'number of women/patients' is significantly smaller than the number of 'consultations' thus indicating there are multiple consultations per person per month recorded.

Supplementary Table 2: Number of Consultations for Reproductive and Maternal Morbidities in NES for 2023. ¹¹

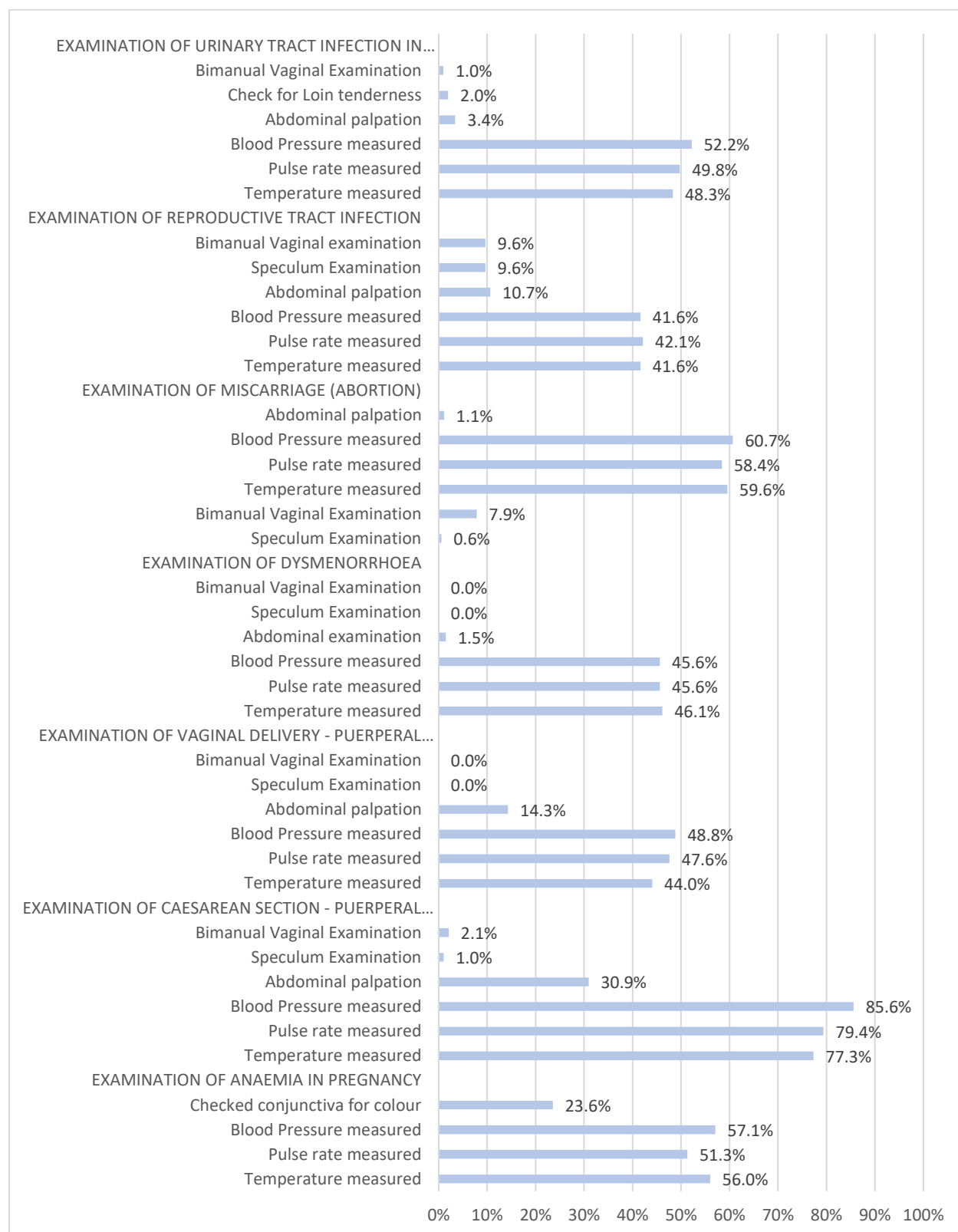
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Anaemia in Pregnancy	2,425	2,110	4,147	4,614	13,296
Puerperal Sepsis or Infection after CS	659	607	541	428	2,235
Puerperal Sepsis or Infection after vaginal birth	969	834	583	758	3,144
Dysmenorrhea	4,300	4,238	4,519	21,008	34,065
Miscarriage (Abortion)	238	502	791	677	2,208
Reproductive Tract Infection	16,067	15,607	16,096	17,087	64,857
Urinary Tract Infection in Pregnancy	4,144	3,708	4,900	4,778	17,530
Total	28,802	27,606	31,577	49,350	137,335

¹¹ Data for 2023 from HIS from 5 main NGO partners working in NES including at 4 Hospitals, 15 CPHC, 23 PHC and 9 Mobile Clinics

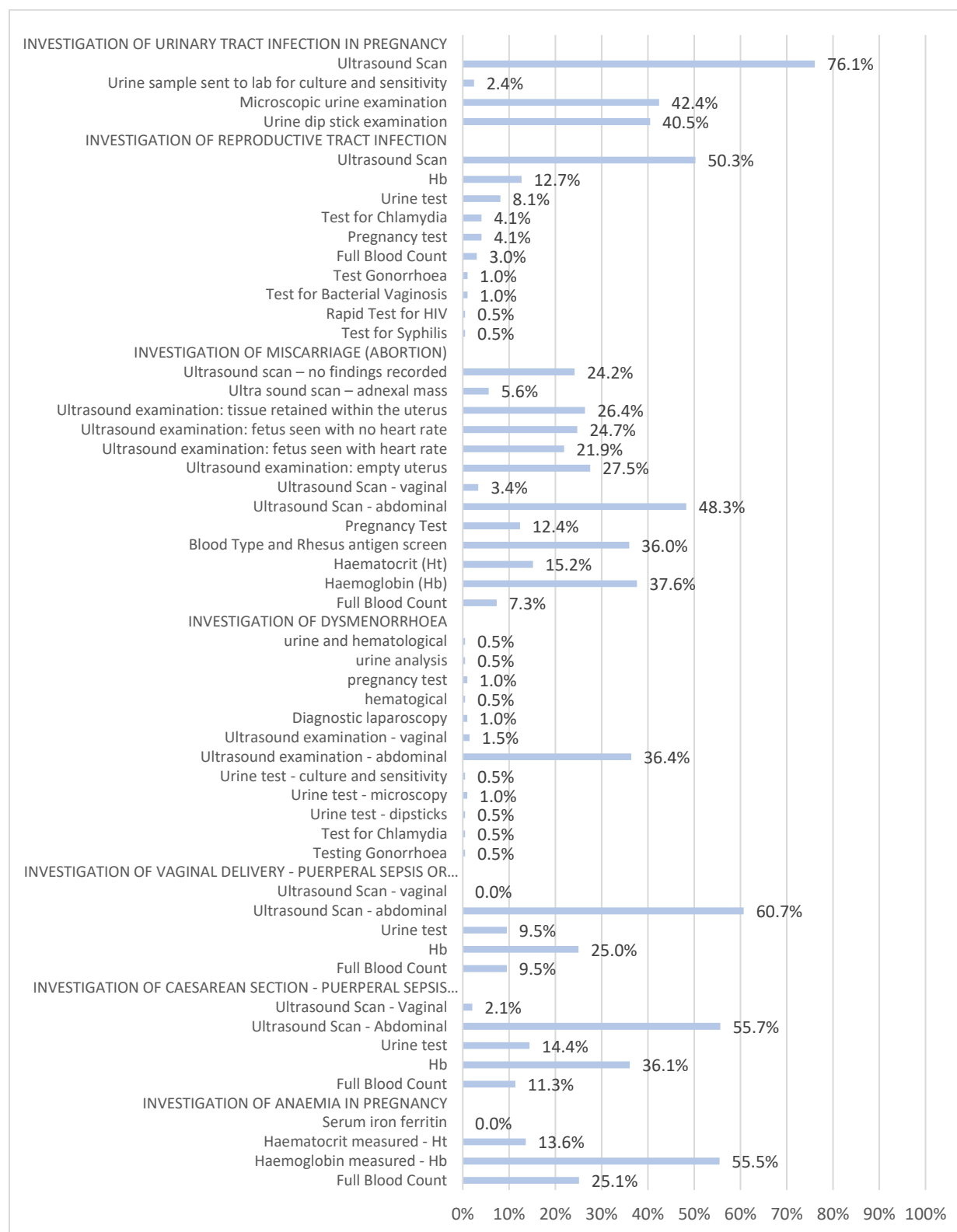
Supplementary Figure 1: Information available for essential components of History taking for all morbidities combined (n= 1,158, % case notes with information available)



Supplementary Figure 2: Information available for essential components of Examination for all morbidities (n= 1,158, % case notes with information available)



Supplementary Figure 3: Information available for essential components of Investigations for all morbidities (n= 1,158, % case notes with information available)



Supplementary Figure 4: Information available for essential components of Management for all morbidities (n= 1,158, % case notes with information available)

