ENAABLERS Study South Africa
Objectives and preliminary results

MURIA June 2017

School of Pharmacy
Sefako Makgatho Health Sciences University

Protocol
2017

APPROPRIATE ANTIMICROBIAL AND VACCINE USE VIA mobile HEALTH AND OTHER TECHNIQUES IN THE REPUBLIC OF SOUTH AFRICA (ENAABLERS PROJECT)

(Application for Part 3 in Humans - New Technology Innovations to Improve Surveillance and Use of Antimicrobials)

INDEPENDENT RESEARCH

Medical Research Council (MRC)

PRINCIPAL RESEARCHERS

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ENAABLERS

ENhancing Appropriate Antimicrobial and Vaccine Use Via Mobile Health and Other Techniques in the Republic of South Africa

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Overarching aim

To develop sustainable innovations
to improve the rational use of antimicrobials and vaccines in SA
in order to reduce AMR
and its devastating health consequences

AMR is a major threat to the sustainability of the health care system

Main objectives of the study

- To **describe and quantify** how AMs are currently utilised in selected public sector hospitals and PHC centres in SA
- To **determine how mHealth** techniques can be used to monitor AM utilisation in selected public sector hospitals and PHC centres in SA
- To assess **current programmes** among public sector hospitals and PHC centres to improve AM prescribing as part of AMSPs and pharmacy and therapeutics committee (PTC) activities
- To **develop interventions**, including mHealth techniques, to enhance the role and activities of AMSPs and PTCs.

Main objectives of the study (2)

- To measure **prescriber compliance to STGs for ID** in public sector hospitals and PHC centres in SA
- To **develop interventions**, including **mHealth techniques,** to monitor and enhance prescribing compliance to STGs
- To determine the **utilisation, uptake and timeliness of vaccines** (EPI and seasonal influenza) in selected public and private sector facilities across SA, as part of an AMS strategy to reduce AMR
- To develop **interventions, including mHealth techniques**, that can be used to enhance the appropriate use of **vaccines** in selected public and private sector facilities across SA

Projects to achieve objectives

- Number of **sub-studies** will be undertaken
- Main objectives further broken down into a number of separate studies
  - Each becoming the aim of other sub-study
  - Conducted for degree purposes
  - PhD and MPharm students
- Each student independently develops his/her own protocol
  - Ethical clearance: Sefako Makgatho University Research Ethics Committee (SMUREC)
- Students able to work on interlinking projects

Student PhD Projects

- **Appropriate use** of **antimicrobials** in paediatrics diagnosed with infective paediatric diarrhoea across public sector health care institutions in South Africa – a multicentre prevalence study
- A **Point Prevalent Survey** of **Antimicrobial Utilization** across healthcare facilities in South Africa
- A multicenter survey of **Adult Sepsis** and the use of the Surviving Sepsis Campaign guidelines in selected intensive care units of South Africa
- Current **Antimicrobial Stewardship Programmes** and activities within Public Health Care Facilities across South Africa
- Utilisation and **uptake of vaccines** amongst elderly persons in **selected public and private sector** facilities across SA (patient, health care professional and policy perspective)

Study sites

- Academic / Tertiary Hospitals: **10**
  - Gauteng (5)
  - KwaZlu-Natal (2)
  - Western Cape (2)
  - Free State (1)
- District hospitals: **9**
  - One from each of the 9 provinces
  - Feeding into the academic hospitals
- Community Healthcare Centres: **18**
  - Two from each of the 9 provinces
  - Feeding into the district hospitals

Criteria for categorising the appropriateness of antimicrobial therapy for infectious paediatric diarrhoea	
Action	**Description**
Appropriate indication • Correct choice of antimicrobial and correct administration • Correct choice of antimicrobial and incorrect use	Correct choice in presence of one or more of the following (EML, 2013): – Dysentery (mucus and blood in stools) – Cholera – Typhoid – Severe Malnutrition – Very young infants, 28 days old – Positive urine/stool microscopy – In persistent diarrhoea: Following the Step-wise Drug based Empiric Protocol for Management of Diarrhoea (Day 6-8)
Inappropriate indication: • Inappropriate decision • Inappropriate choice • Incorrect use • Insufficient information	**Inappropriate decision** • No infection, no prophylaxis needed and no antimicrobial needed • No infection, antimicrobial used as prophylaxis and no antimicrobial needed • Infection, no antimicrobial used, antimicrobial needed **Inappropriate choice** • Different antimicrobial therapy needed, than what is prescribed: – unnecessary divergence from antimicrobial guidelines – spectrum was overly broad – spectrum was not broad enough **Incorrect use** • Incorrect dose • Incorrect dosing interval • Incorrect route of administration • Incorrect duration of therapy **Insufficient information** • No infection, insufficient diagnostic information on whether antimicrobial was needed • Infection, insufficient diagnostic information on whether antimicrobial was needed • Infection, antimicrobial needed, insufficient information on whether choice and administration were correct • Antimicrobial given, insufficient diagnostic information about infection

* More than one criterion per prescription may apply.
*Consider septicaemia (infants <2 months, immunocompromised, severe malnutrition)
*Consider urinary tract infection

Point prevalence survey of antimicrobial utilisation in an academic hospital in the Gauteng province

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AIMS

- The principal aim was to **quantify** and describe current **antimicrobial consumption** in Dr George Mukhari Hospital alongside the current use and availability of sensitivity testing.

- Secondary aims included documenting the extent of current **programmes to improve antibiotic prescribing** including prescribing guidelines, pharmacy and therapeutics committees (PTCs) and antimicrobial stewardship programmes.

Concluding statements

- The use of **broad spectrum penicillins** was high followed by **cephalosporins**
- Even though the **number of patients** who were **not** on antibiotics were **more** than the ones on antibiotics, more than half had used antibiotics in the **past 90 days**
- The use of antibiotics **without** taking **cultures** was high and it pose a huge concern as antimicrobials **may be** used **inappropriately.**

Challenges with data collection

- Time Consuming – Paper Based System (40 minutes per file)
- Hospital Size – 1500 beds
- The files are kept separately (e.g. nursing and doctor information)
- PPS time for initiating the study (08:00) – very busy time in wards
- Data training - time consuming; committed individuals that has to be consistent in collecting the data
- All fields not applicable to the South African setting on the form – e.g. some aspects do not translate to the local health care setting

ENAABLERS APPLICATION

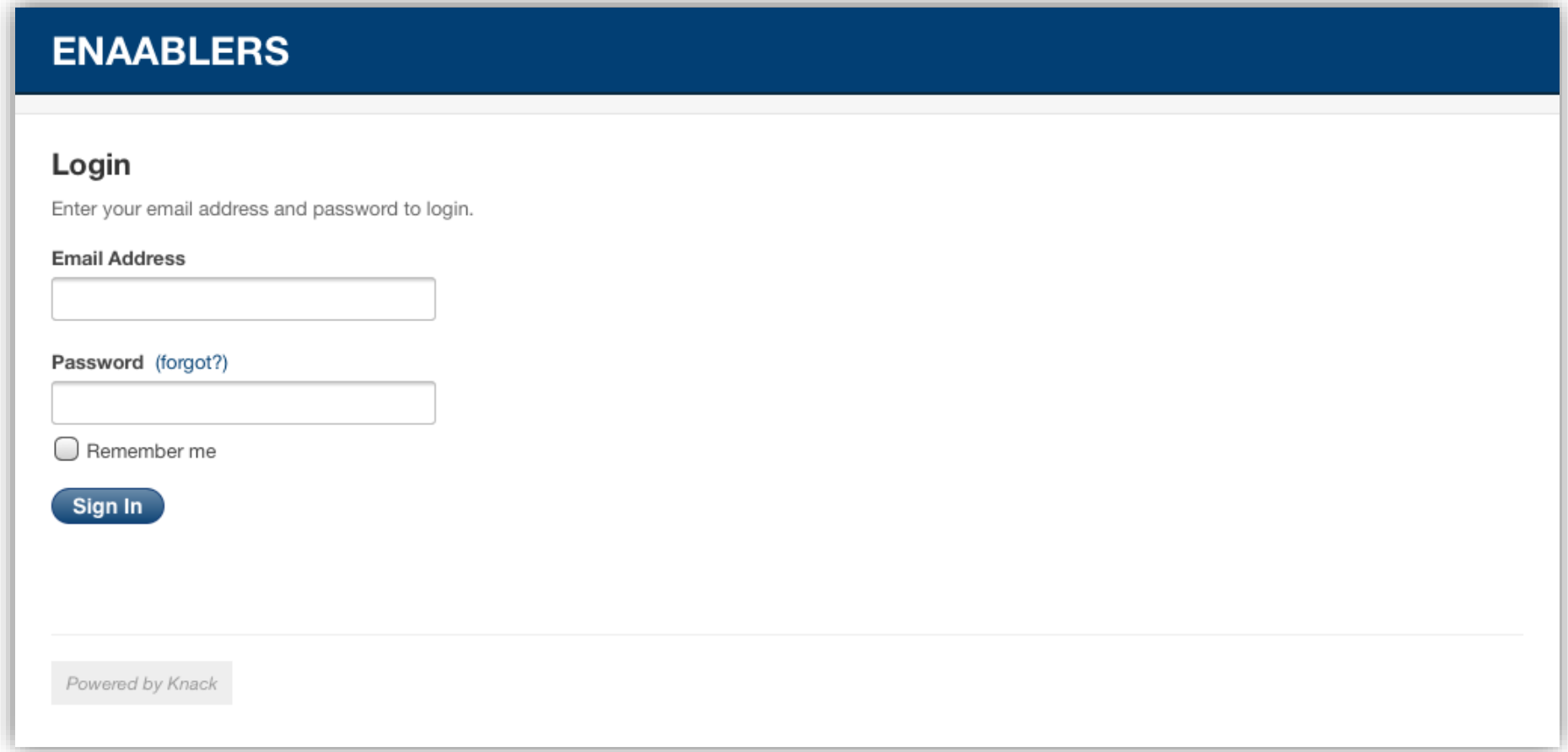
- **Aim:**
  To assist data capturers with an online web-app to capture data for the PPS study.

- **Objectives:**
  - Ensure data capturing is not complicated (Keep it simple)
  - Centralization of captured information.
  - Multiple user access to the application on all web-based platforms.
  - Centralized changes to reflect instantly on all platforms.
  - Controlling of data.
  - Exporting of data into reviewable platforms e.g. Microsoft Excel.

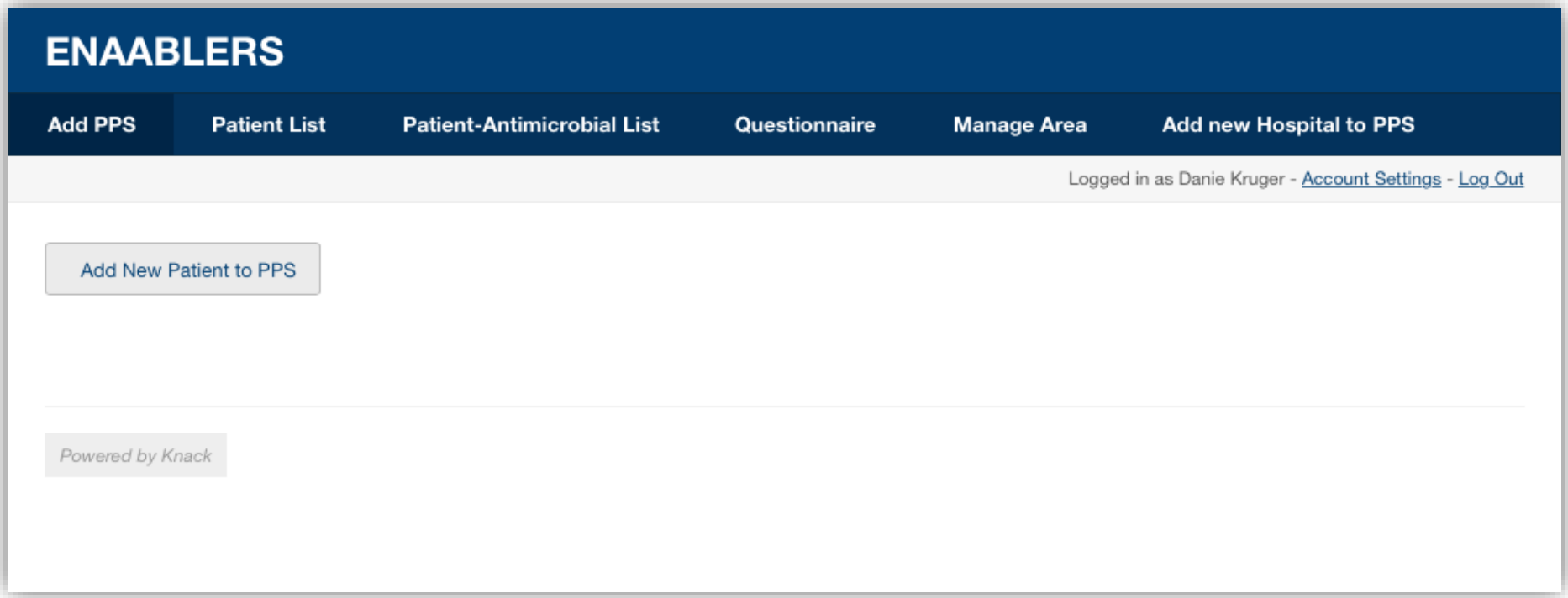
Methodology

- The application was developed on a web-based builder.
- The application was designed for users to only be able to view, edit or delete their own data.
- The Patient data section (section 1) fields were created on the web-application.

Login screen



Pages


ENAABLERS
Add PPS
Patient List
Patient-Antimicrobial List
Questionnaire
Manage Area
Add new Hospital to PPS
Logged in as Danie Kruger - Account Settings - Log Out
Add New Patient to PPS
Powered by Knack

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Add new Hospital to PPS

Add PPS → Add Patient Logged in as Danie Kruger - Account Settings - Log Out

Add New patient to PPS

Here you add new Patients to PPS.

To edit a patient: Click on the "Patient List tab" (in the top row) and select edit in the table.

Hospital *

- ○ Test E
- ○ Test D
- ○ Test C

Data colection date

12/05/2017

Ward Code: *

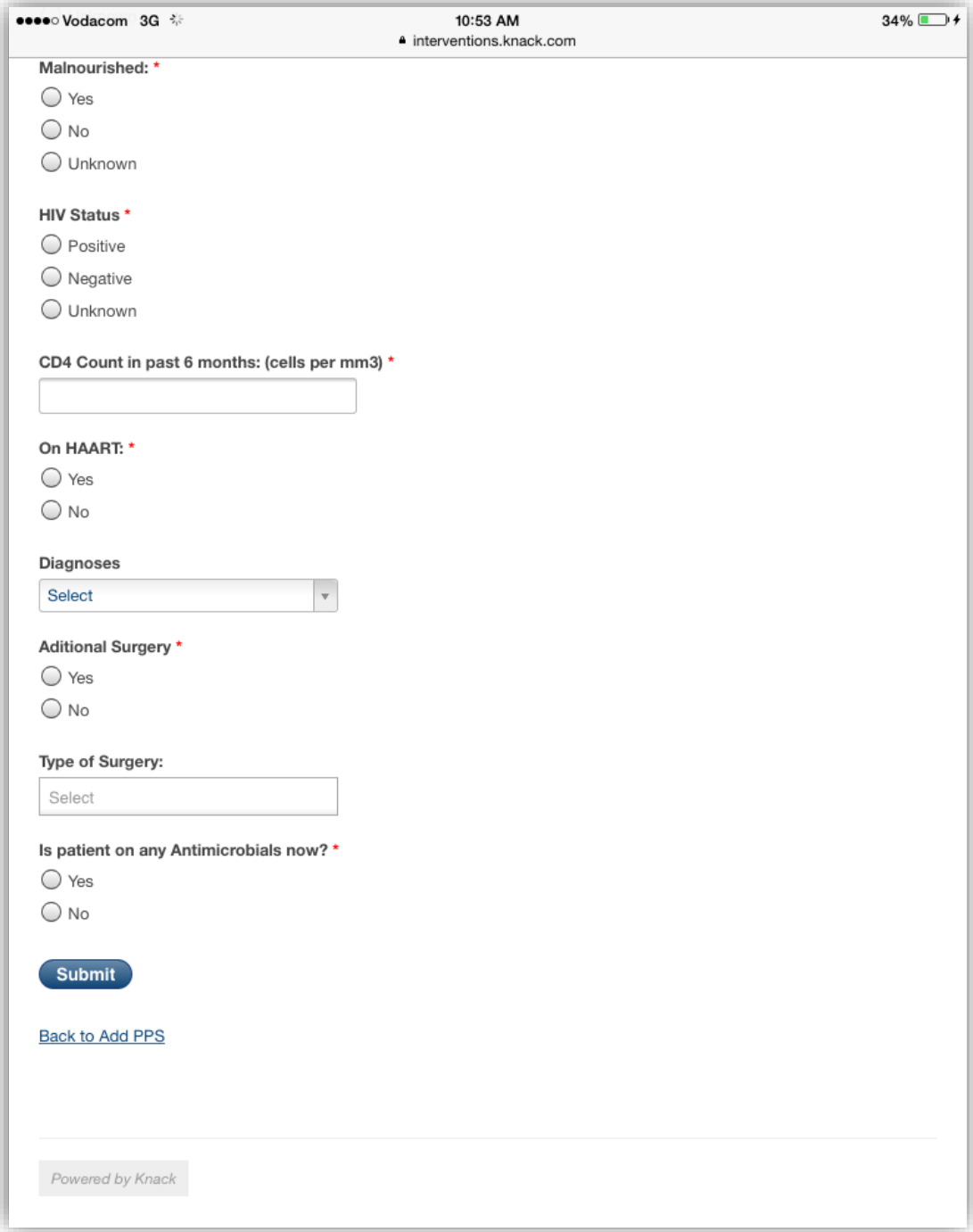
- ○ Paediatric Medical Ward - PMW
- ○ Haematology - Oncology Paediatric Medical Ward - HO-PMW
- ○ Transplant BMT/Solid Paediatric Medical Ward - T-PMW
- ○ Paediatric Surgical Ward - PSW
- ○ Paediatric ICU - PICU
- ○ Neonatal Medical Ward - NMW
- ○ Neonatal ICU - NICU
- ○ Adult Medical Ward - AMW
- ○ Haematology - Oncology Adult Medical Ward - HO-AMW
- ○ Transplant BMT/solid Adult Medical Ward - T-AMW
- ○ Pneumology Adult Medical Ward - P-AMW
- ○ Adult Surgical Ward - ASW
- ○ Adult ICU - AICU
- ○ Obs and Gynae Ward - OBGY

Patient Code : NM *

Did the patient give Concent

- ○ Yes
- ◉ No

Submit



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Fields for data input

The application was programmed to show/hide fields based on inputs: e.g.

- *If consent was not obtained all the rest of the fields are hidden.*
- *If Antimicrobial use in past 90 days is –No then "Previous Antimicrobials" and "duration" would be hidden.*
- *If HIV Status is negative – CD4 Count field would be hidden*
- *If Additional surgery is no- Type of surgery would be hidden.*
- *If the field "Is patient on any Antibiotics now" is yes then the application would automatically take the user to the second section.*

Antimicrobials

This section 2 (Antimicrobials) includes the following:

- Medication name – (based on standardized list of Antimicrobials)
- Dose in mg- (Issue with IU)
- Frequency (Every_____ hours)
- Route: Std list
- IV Bolus or Continuous*

Additional Fields Entered

The Questionnaire:

- *The questionnaire was also added to the application*

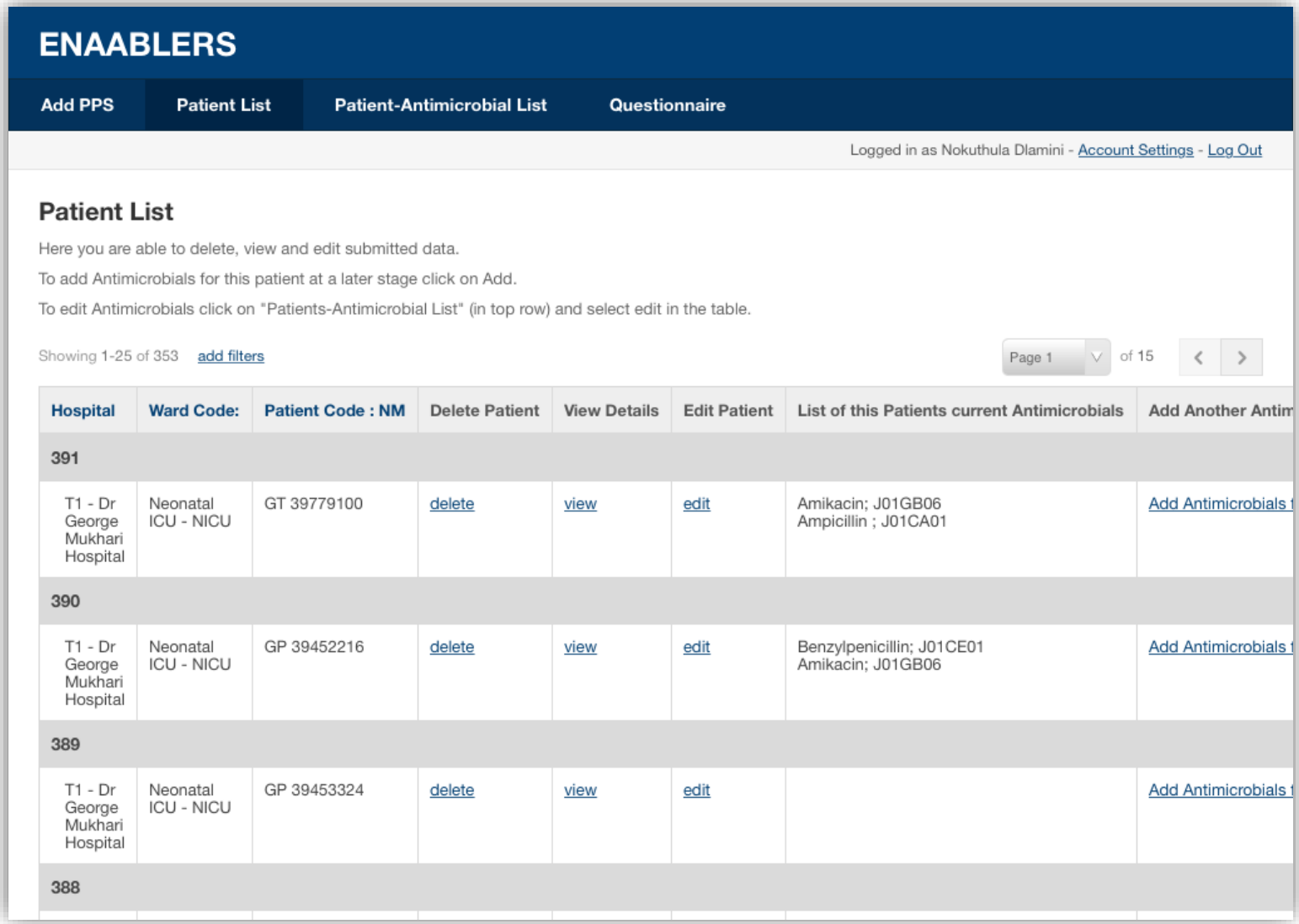
Additional requests:

- *There was a request from the local users to add Anti-Fungal, Anti-Viral and TB drugs to the current item list.*
- *There might be a need to standardize on Isolates names. (Reporting purposes)*
- *Currently we captured around 500 surveys on the system. (One hospital only)*
- *We recently added another 12 users to the application to start with second phase testing. (Additional 2 hospitals)*

Data Exports to:

- *csv (Comma separated values) – (.csv)*
- *text (.txt)*
- *json (JavaScript Object Notation)- (.json)*

Patient List



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Add PPS | Patient List | Patient-Antimicrobial List | Questionnaire

Logged in as Nokuthula Dlamini - Account Settings - Log Out

Patient List

Here you are able to delete, view and edit submitted data.

To add Antimicrobials for this patient at a later stage click on Add.

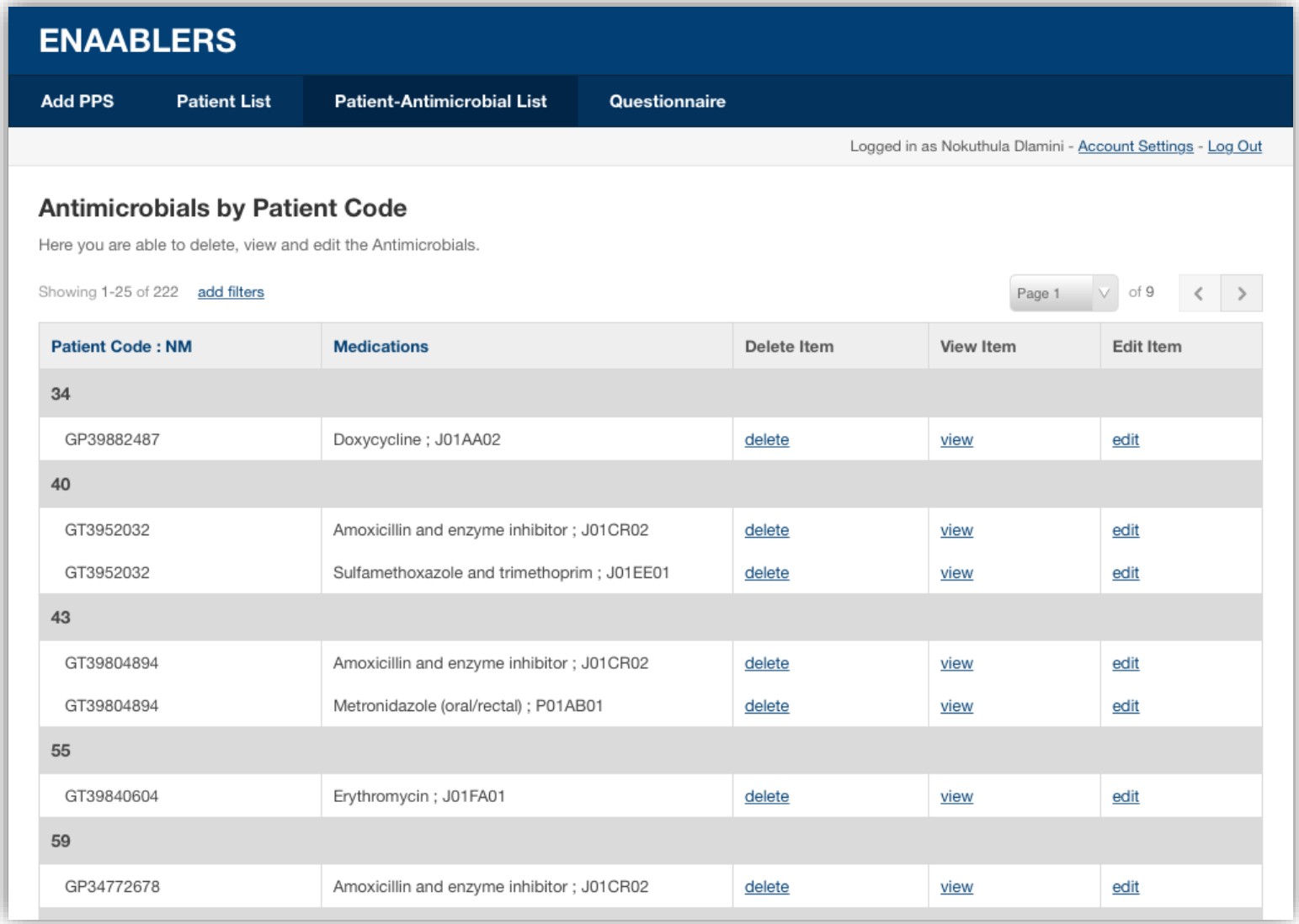
To edit Antimicrobials click on "Patients-Antimicrobial List" (in top row) and select edit in the table.

Showing 1-25 of 353 add filters

Page 1 of 15

Hospital	Ward Code:	Patient Code : NM	Delete Patient	View Details	Edit Patient	List of this Patients current Antimicrobials	Add Another Antim
391							
T1 - Dr George Mukhari Hospital	Neonatal ICU - NICU	GT 39779100	delete	view	edit	Amikacin; J01GB06 Ampicillin ; J01CA01	Add Antimicrobials f
390							
T1 - Dr George Mukhari Hospital	Neonatal ICU - NICU	GP 39452216	delete	view	edit	Benzylpenicillin; J01CE01 Amikacin; J01GB06	Add Antimicrobials f
389							
T1 - Dr George Mukhari Hospital	Neonatal ICU - NICU	GP 39453324	delete	view	edit		Add Antimicrobials f
388							

Patient Antimicrobial List



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Add PPS | Patient List | Patient-Antimicrobial List | Questionnaire

Logged in as Nokuthula Dlamini - Account Settings - Log Out

Antimicrobials by Patient Code

Here you are able to delete, view and edit the Antimicrobials.

Showing 1-25 of 222 add filters

Page 1 of 9

Patient Code : NM	Medications	Delete Item	View Item	Edit Item
34				
GP39882487	Doxycycline ; J01AA02	delete	view	edit
40				
GT3952032	Amoxicillin and enzyme inhibitor ; J01CR02	delete	view	edit
GT3952032	Sulfamethoxazole and trimethoprim ; J01EE01	delete	view	edit
43				
GT39804894	Amoxicillin and enzyme inhibitor ; J01CR02	delete	view	edit
GT39804894	Metronidazole (oral/rectal) ; P01AB01	delete	view	edit
55				
GT39840604	Erythromycin ; J01FA01	delete	view	edit
59				
GP34772678	Amoxicillin and enzyme inhibitor ; J01CR02	delete	view	edit

Thank you for your attention

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Study Sites

Academic Hospital (10)	District Hospital (9)	Community Health Centre (18)
Gauteng Province		
Charlotte Maxeke Hospital	Tshwane District Hospital	Laudium CHC
Chris Hani Baragwanath Hospital		Stanza Bopape CHC
Dr George Mukhari Academic Hospital		
Steve Biko Academic Hospital		
Nelson Mandela Academic Hospital		
Free State Province		
Universitas (C) Hospital	National Hospital	Mamello CHC
		Zamdela CHC
Province of Kwazulu-Natal		
Inkosi Albert Luthuli Central Hospital	Greys Hospital (Tertiary)	East Boom CHC
King Edward VIII Hospital		Imbalenhle CHC
Province of Western Cape		
Groote Schuur Level 3 Hospital	Hermanus Hospital	
Tygerberg Level 3 Hospital		
Province of Eastern Cape		
	Settlers	
Limpopo Province		
	Tshilidzini Hospital (Regional)	
Province of Northern Cape		
	Postmasburg Hospital	
North West Province		
	Moses Kotane Hospital	
Mpumalanga Province		
	Lydenburg Hospital	