



Roles of registered nurses in antimicrobial stewardship

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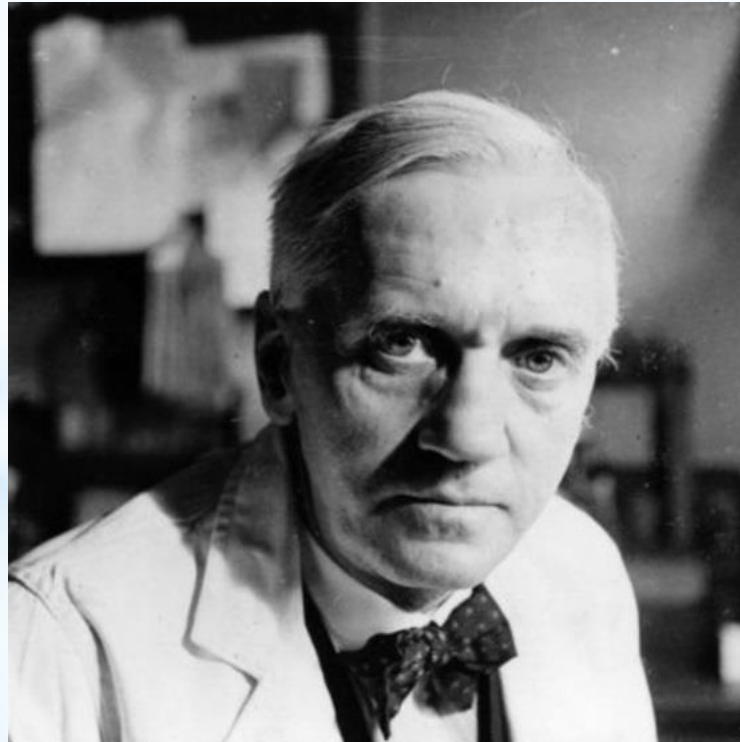
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“ In such cases, the thoughtless person playing with penicillin is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism.”

Sir Alexander Fleming (26 June 1945)



Acknowledgment

“No one can whistle a symphony.
It takes a whole orchestra to play it.”

Halford Luccock

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New Zealand Nurses Organisation

All participants (Registered nurses in the greater Auckland region)

What is antimicrobial stewardship?

Antimicrobial stewardship is a coordinated program that promotes

1. appropriate use of antimicrobials (including antibiotics),
2. improves patient outcomes,
3. reduces microbial resistance, and
4. decreases the spread of infections caused by multidrug-resistant organisms.

World Health Organization recommendation

- a. WHO global AMR surveillance report (2014) highlighted that **AMR is a serious global threat** to public health.
- b. WHO calls for a **multidisciplinary approach** of AMS programme in all health care institutions across the globe to facilitate appropriate antibiotic use (WHO, 2015).

Rationale of antibiotic use

- **Treating infections**

Centres for Disease Control and Prevention (2011) stated that “Half of US hospital patients were taking antibiotics; 25 percent on two or more” .

- **In the agriculture, antibiotics are used to promote growth of livestock.**

What has gone wrong?

In New Zealand, evidence suggested irrational antibiotic use nationally and a rising rate of AMR particularly in Auckland.

NZ has smaller incidence rates of AMR compared to other countries; however, there is a rising rate (Thompson, 2013; Thomas *et al.*, 2014; MOH, 2016).

Pharmacy sales in 71 countries revealed very high antibiotic use in New Zealand, as evidenced by an increase in use per person from **26** units in 2000 to **70** units in 2010 (Van Boeckel *et al.*, 2014).

What has gone wrong?

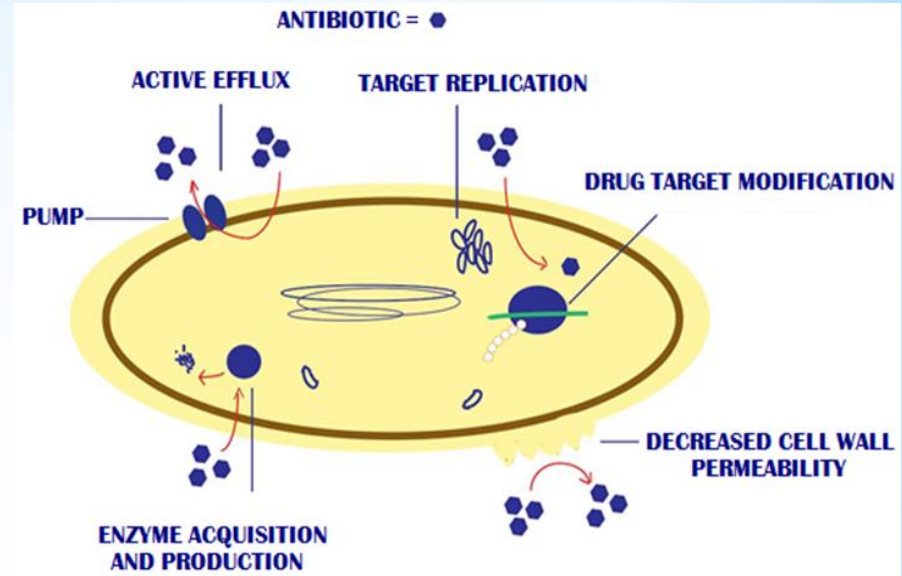
Rural Context

In **Tairāwhiti**, 51% of the population were prescribed one or more antibiotics in the year during which the study was undertaken, suggesting high antibiotic use (*Norris et al.*, 2011).

As implied by *Norris et al.* (2011), **underprescription** of antibiotics in high-risk Māori and Pacific Island populations and **overprescription** of antibiotics in the general population **highlights a disparity in prescribing** whereby antibiotics are being injudiciously prescribed for a low-risk population.

Mechanisms of antimicrobial resistance

1. Active efflux
2. Target replication
3. Drug target modification
4. Decreased cell wall permeability
5. Enzyme acquisition and production

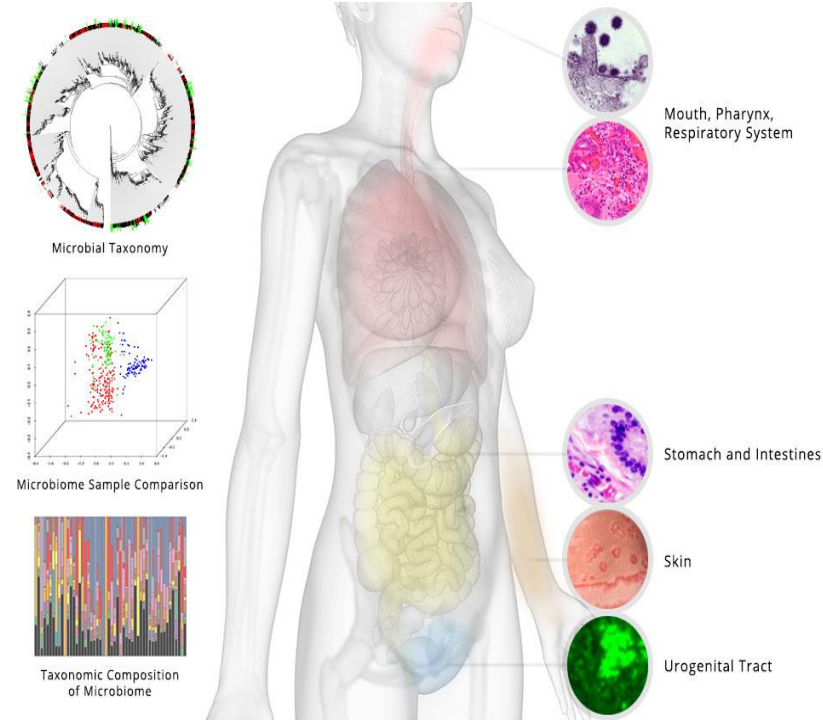
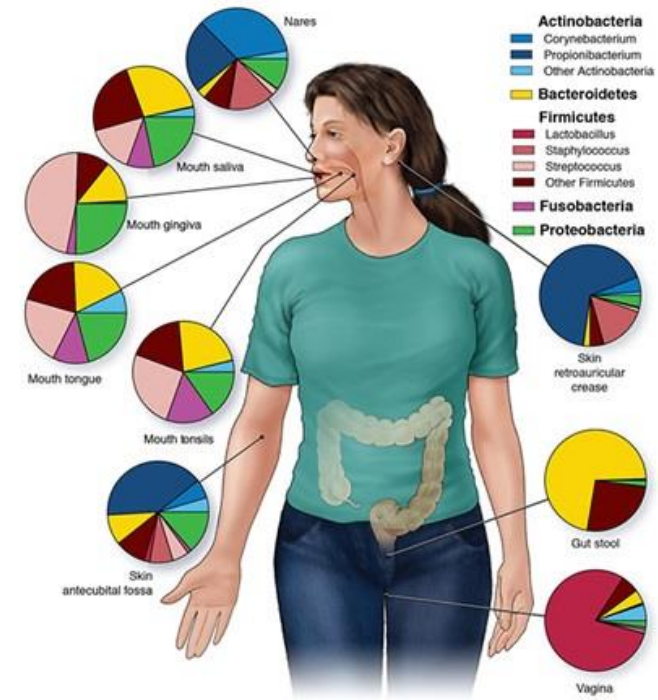


Risks with antibiotic use

- a. Antibiotic resistance
- b. Adverse drug events and allergies
- c. Drug side effects
- d. *Clostridium difficile* infection
- e. Antibiotic associated diarrhoea/ colitis
- f. Increased morbidity and mortality
- g. Increased health-care expenditure
- h. Alteration of the human microbiota

The human microbiota

- a. The human microbiota refers to the vast collection of microorganisms that naturally colonise the human body, including the skin, nose, and gastrointestinal and genitourinary tracts (Madigan *et al.*, 2015).
- b. There are an estimated 10^{14} (**100 trillion**) microorganisms in the human microbiome, which is approximately 10 times more than the total number of cells in the human body (Madigan *et al.*, 2015).



What registered nurses can do?

1. Risk reduction e.g., by checking allergy status and reducing IV line days (Gillespie *et al.*, 2013; Fehily *et al.*, 2015)

What registered nurses can do?

2. Initiation or escalating a conversation about the need for early and appropriate blood cultures for patients suspected to have sepsis

What registered nurses can do?

3. Ensuring that antimicrobial treatment is in line with microbiology results and reviewing the need for antibiotics (Edwards *et al.*, 2011)

What registered nurses can do?

4. Checking that an antibiotic prescription is in agreement with antibiotic guidelines or protocols (Edwards *et al.*, 2011)

What registered nurses can do?

5. Monitoring ADRs to antibiotics or development of antibiotic resistance (Olans *et al.*, 2016)

What registered nurses can do?

6. Checking that antimicrobial therapy is prescribed and in line with its standard recommended duration.

What registered nurses can do?

7. Initiating discussion of switching IV to oral antimicrobial therapy (Edwards *et al.*, 2011)

What registered nurses can do?

8. Checking that surgical antibiotic prophylaxis is prescribed for the appropriate duration as recommended (Edwards *et al.*, 2011)

What registered nurses can do?

9. Ensuring that antibiotics are initiated and administered at the correct time as prescribed and recommended

What registered nurses can do?

10. Decision-making on patient suitability for outpatient IV antibiotic services (Edwards *et al.*, 2011)

What registered nurses can do?

11. Education and advocacy for implementation of antimicrobial stewardship practices in the workplace

What registered nurses can do?

12. Patient and family education, *e.g.*, safe antibiotic use and immunisation against avoidable infectious illnesses

Where is the gap?

A multidisciplinary approach, involving all HCPs is needed to combat AMR (Charani *et al.*, 2014). The roles of doctors and pharmacists are very well contextualised in AMS.

- a. The role of registered nurses (RNs) in this regard, other than as infection control practitioners is not well-understood.
- b. Little is known about the knowledge of practising RNs concerning use of antibiotics, AMR and especially in the New Zealand context.

RESEARCH FINDINGS

Aim

This study assessed knowledge of nurses concerning antibiotics, AMR and AMS; and to assess their perceptions on the potential roles as antimicrobial stewards.

Methods

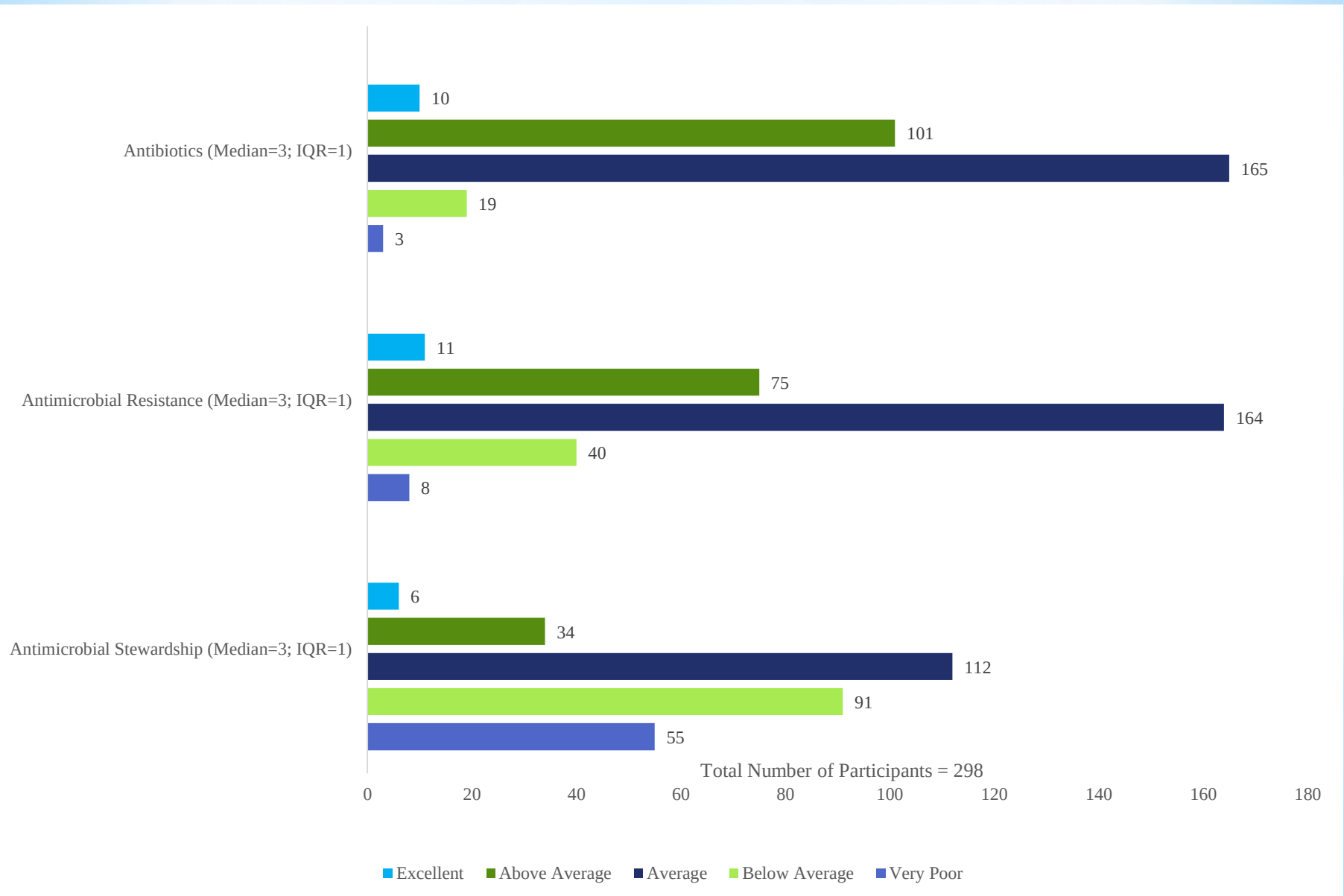
An online survey was used (Qualtrics survey software) (purely quantitative).

Ethical approval procured from The University of Auckland, A DHB and CMH Research Offices.

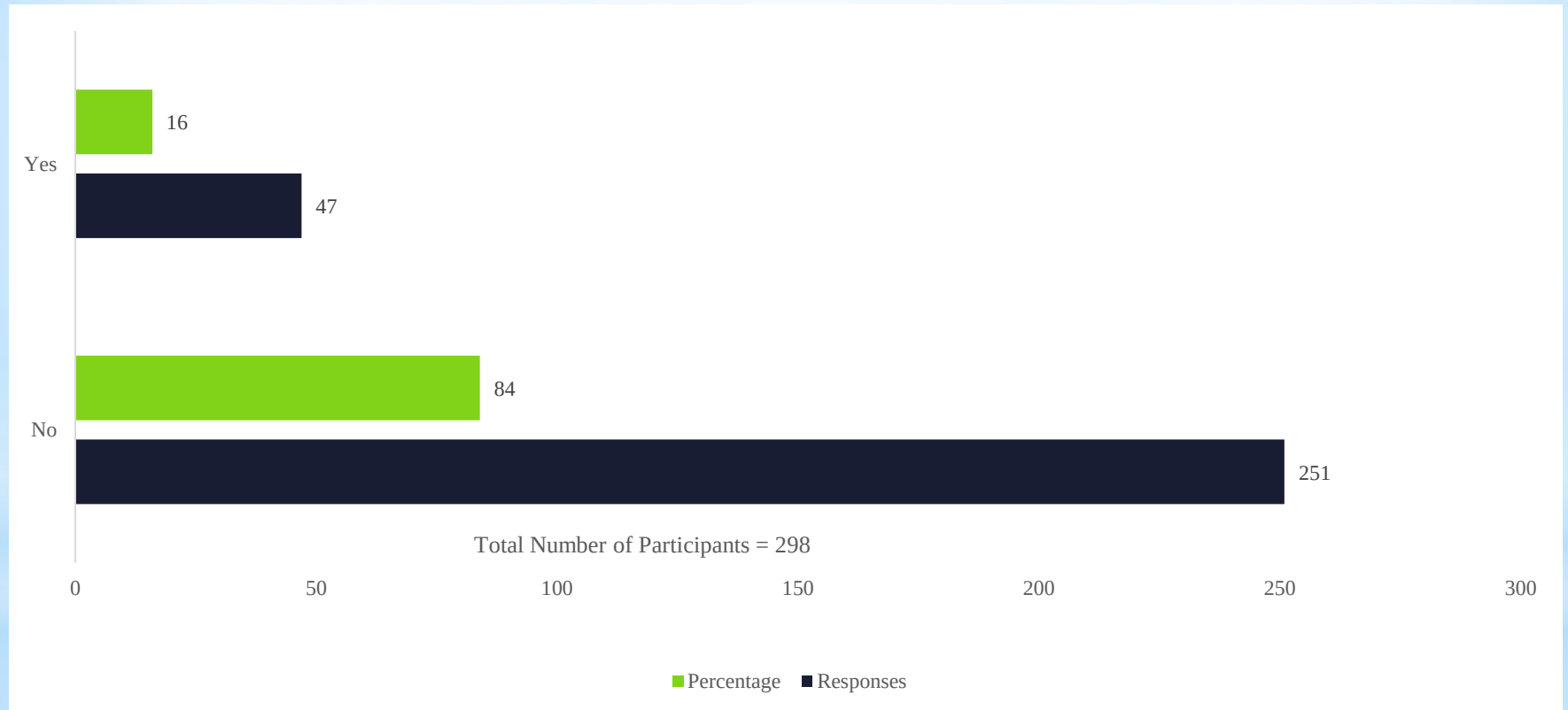
369 attempts; ($N = 298$) participants completed the survey.

Descriptive and inferential statistics were used.

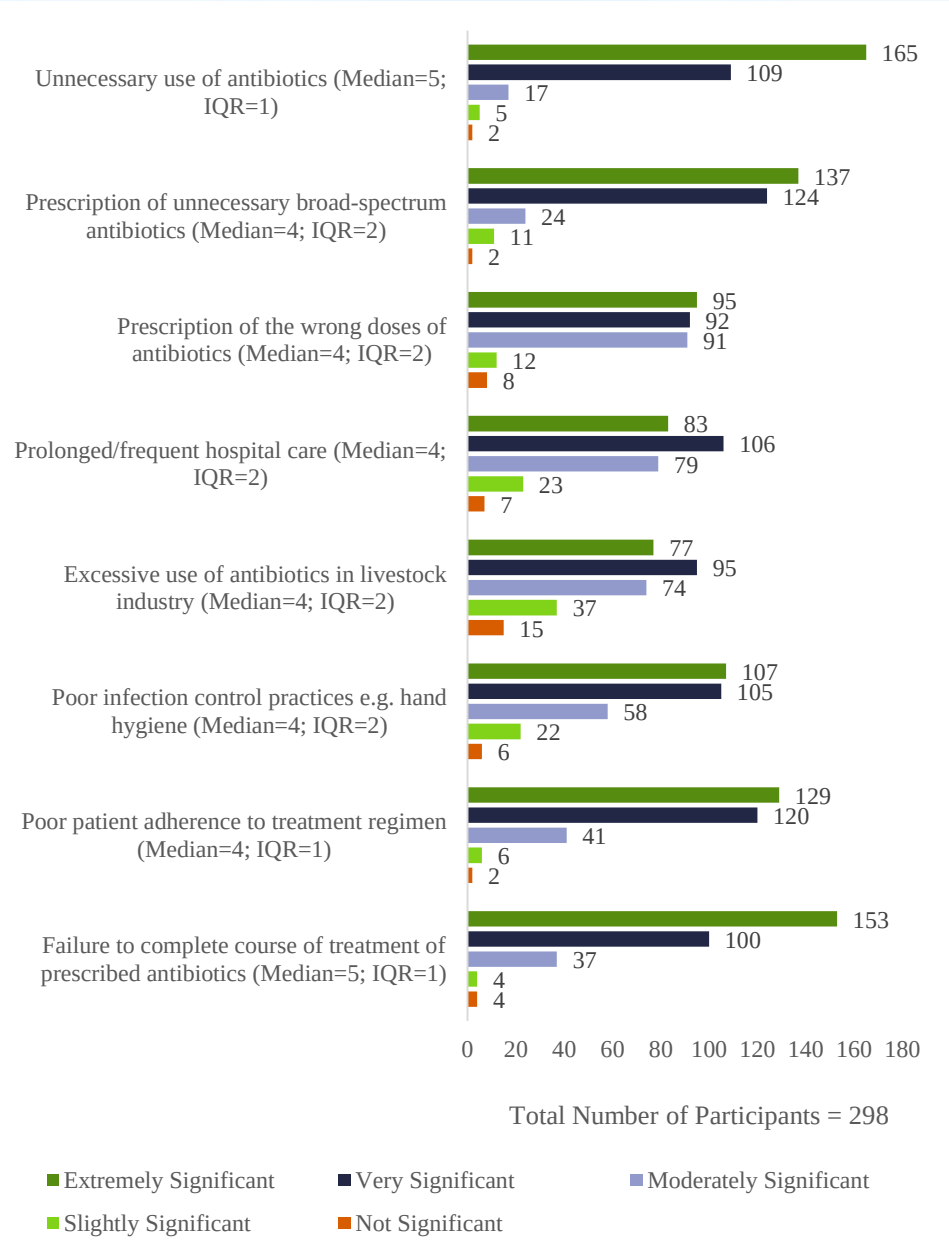
Knowledge on antibiotics, AMR and AMS



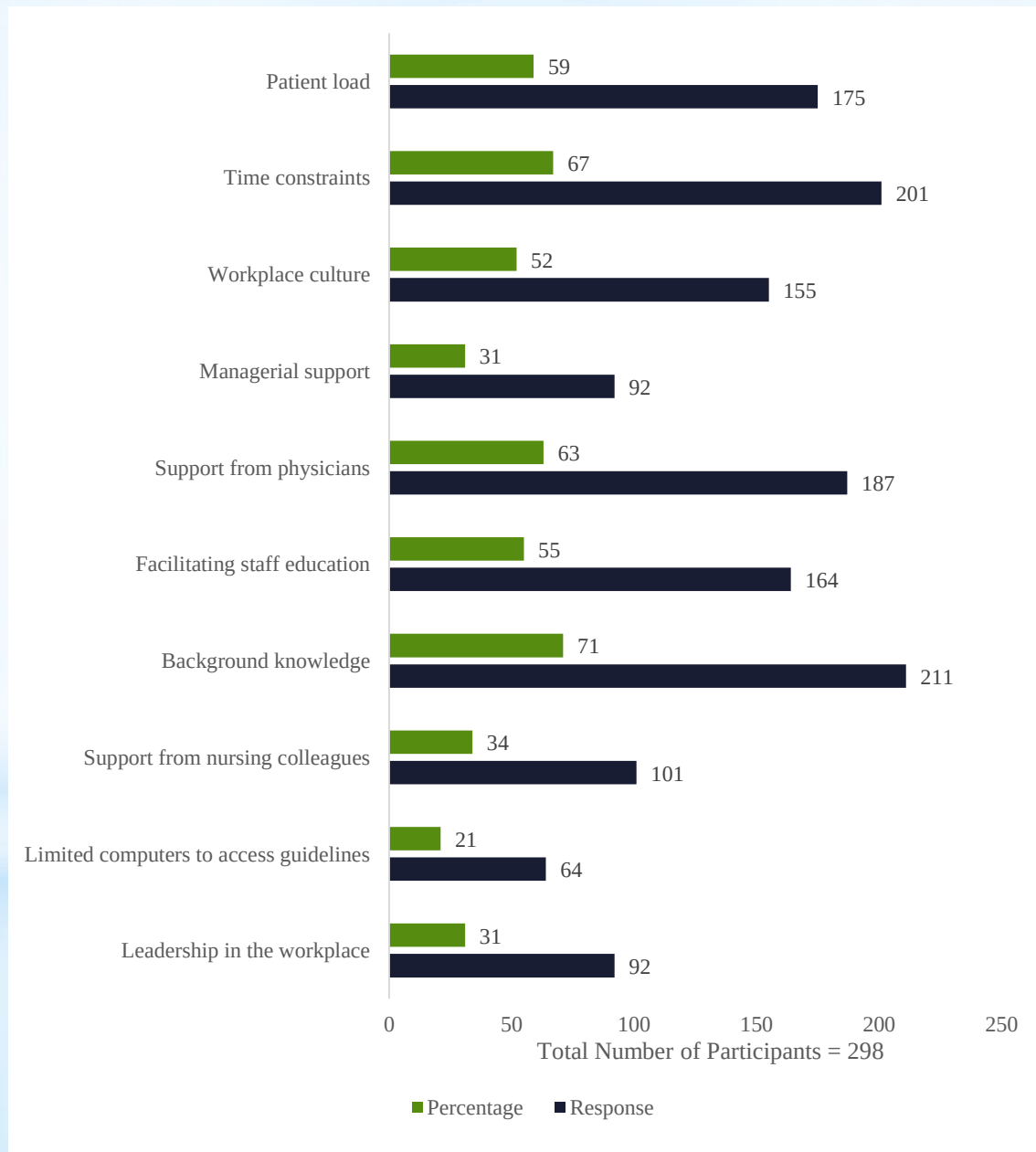
Have you heard of AMS being implemented in your place of work?



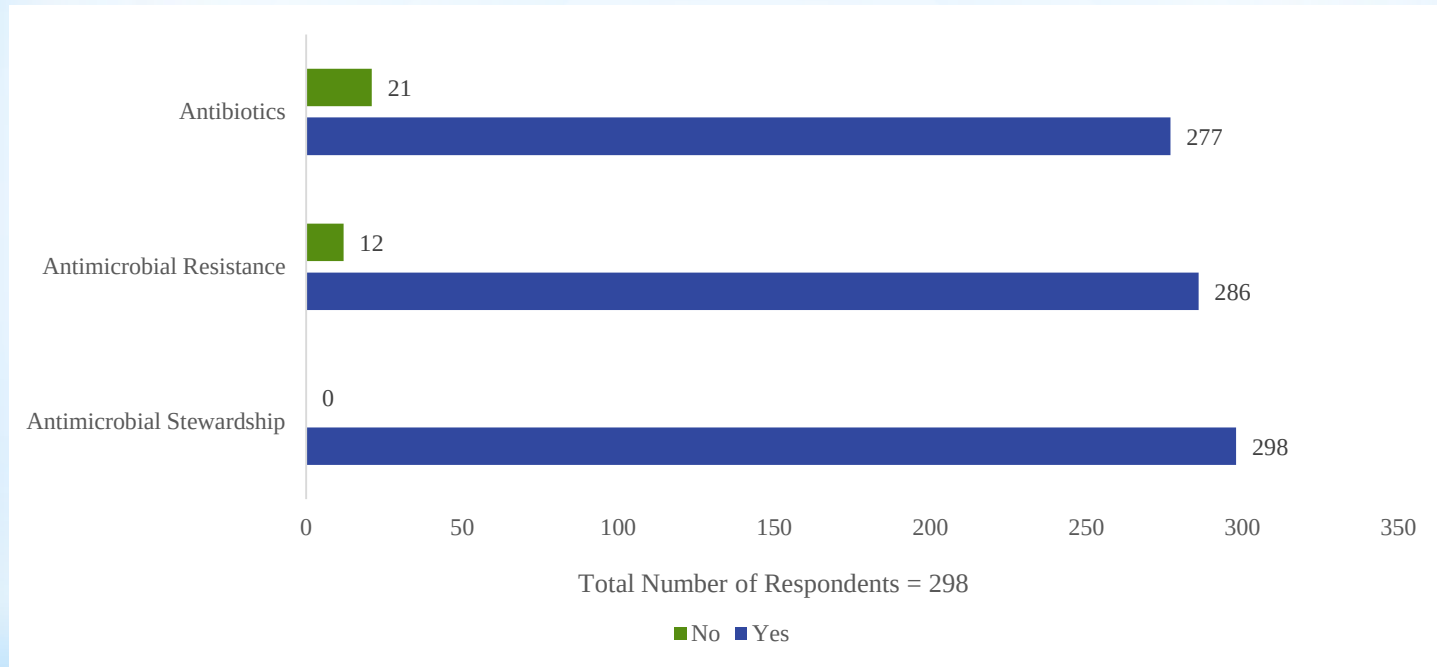
Causes of AMR



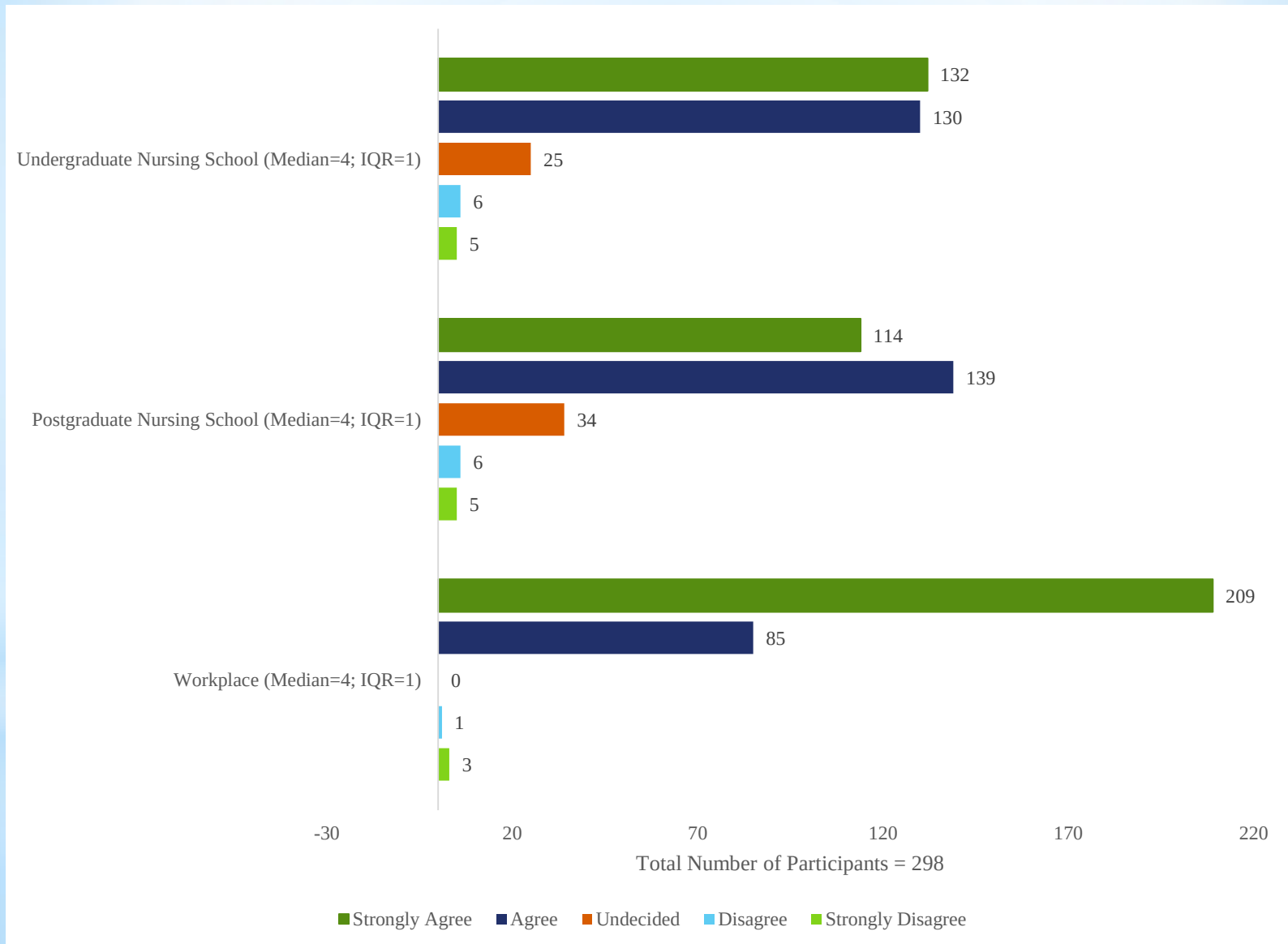
Challenges in integrating AMR in clinical practice



Do you want further training and education on the following?



Where should further training and education on AMS be facilitated?



Conclusion

Nurses play vital roles in addressing AMR and in contributing to AMS efforts

Therefore, further training and education to address health literacy needs of RNs and their roles in AMS is paramount.

The WHO recommended a multidisciplinary approach to proper use of antibiotics.

Not including nurses and not responding to the learning needs of nurses for further training and education on Antimicrobial Stewardship

**DOES NOT SERVE A TRUE
MULTIDISCIPLINARY
APPROACH.**

Where do we go from here?

1. Collaborate with AMS committee, nursing and medical leaders in health care institutions
2. Invite the Nursing Council of New Zealand, NZNO, College of Nurses Aotearoa to issue a position statement in line with that of the Ministry of Health.
3. Education in all levels: undergraduate, postgraduate and in the workplace.
4. Widespread campaign on safe antibiotic use.
5. Further research on nursing involvement in antimicrobial stewardship programme.

**BATTLING
ANTIMICROBIAL
RESISTANCE IS A**

**HERCULEAN
TASK.**



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