

Antimicrobial stewardship/infection control in children

Thank you for taking part in this survey which has been developed by the WSPID AMR group in collaboration with members from the regional paediatric ID societies. We are aiming to determine strengths and gaps in the way healthcare services in low and middle income countries prevent the development and spread of resistant infections in children, compared with higher income countries. It should take 10-20 minutes depending on how well you know your hospital. We need your thoughts, not just information. You can save your answers and return to finish later if needed.

Thank you very much!

Details about you and your hospital (this is just for tracking purposes - ALL identifying personal and hospital data will be removed prior to dissemination of results/publication)

Your name

{{name}} text

(You don't have to provide this but please do unless you object, and if you would like to be acknowledged in any publication. If you don't provide it, please just put a pseudonym so we can be confident only one person is responding per hospital/healthcare setting)

Your role

{{role}} dropdown

- ☐ {1} Paediatric ID consultant/attending physician or trainee
- ☐ {2} Adult ID consultant/attending physician or trainee
- ☐ {3} General paediatric consultant/attending physician or trainee
- ☐ {4} General adult consultant/attending physician or trainee
- ☐ {5} Neonatologist
- ☐ {6} AMS pharmacist - only/mostly paediatrics
- ☐ {7} AMS pharmacist - only/mostly adults
- ☐ {8} General pharmacist
- ☐ {9} Infection control nurse/Infection preventionist
- ☐ {10} General paediatric nurse
- ☐ {11} Microbiologist/Microbiology scientist
- ☐ {12} General practitioner/primary healthcare provider
- ☐ {13} Other

If other role, what?

{{role_other}} text

{Branching logic (show if): [role] = '11'}

Which country are you working in?

{{country}} text

Your hospital/healthcare service

{{hospital}} text

Hospital/healthcare service classification

{{hospital_type}} radio

- ☐ {1} Tertiary paediatric hospital
- ☐ {2} Public hospital in a medium/large city
- ☐ {3} Public hospital in a small town
- ☐ {4} Public rural hospital
- ☐ {5} Private hospital
- ☐ {6} Community health service/primary care
- ☐ {7} Other

Approximate PAEDIATRIC bed numbers (excluding NEONATAL)

{[paediatric_beds] text}

{Branching logic (show if): [hospital_type] = '1' or [hospital_type] = '2' or [hospital_type] = '3' or [hospital_type] = '4' or [hospital_type] = '5'}

Approximate NEONATAL bed numbers

(after this question, paediatric and neonatal both come under the term PAEDIATRIC)

{[neonatal_beds] text}

{Branching logic (show if): [hospital_type] = '1' or [hospital_type] = '2' or [hospital_type] = '3' or [hospital_type] = '3' or [hospital_type] = '5'}

Approximate number of PAEDIATRIC patients seen by your team per day (combine inpatient and outpatient)

{[numbers_ipop] text}

Which of the following PAEDIATRIC services do you have at your hospital/healthcare service?

(Please check ALL that you are aware of)

{[paed_services] checkbox}

- ☐ {1} General paediatrics
- ☐ {2} General paediatric surgery
- ☐ {3} Haematology/Oncology
- ☐ {4} Bone marrow transplant
- ☐ {5} Solid organ transplant
- ☐ {6} Cardiothoracic or neurosurgery
- ☐ {7} ICU (paediatric or combined with adults)
- ☐ {8} Neonatal ICU
- ☐ {9} Special care baby nursery
- ☐ {10} Obstetrics

Antimicrobial stewardship (AMS) program and activities

Does your hospital/healthcare service have a formal AMS program?

(This means an organised system for strategy, guidelines, restriction, education, etc about antibiotics by a multidisciplinary group. It is more than just using an antibiotic guideline)

{[ams_program] radio}

- ☐ {1} Yes - formally includes paediatric patients
- ☐ {2} Yes - but adult-focused
- ☐ {3} In development
- ☐ {4} No
- ☐ {5} Unknown

If known, approximately what year was the program established?

{[year_established] text}

{Branching logic (show if): [ams_program] = '1' or [ams_program] = '2' or [ams_program] = '3'}

Which of the following personnel do you have at your hospital/healthcare service?

(tick all that apply)

{[personnel] checkbox}

- ☐ {1} Paediatric ID physician
- ☐ {2} Adult ID physician
- ☐ {3} Pharmacist specialising in AMS/ID
- ☐ {4} Other pharmacist
- ☐ {5} Microbiologist
- ☐ {6} Infection control practitioner/nurse/infection preventionist
- ☐ {7} Paediatrician

Do AMS/ID rounds occur at your hospital/healthcare service?

{[rounds] radio}

- ☐ {1} Yes
- ☐ {2} Only for specific patient referrals
- ☐ {3} No
- ☐ {4} Unknown

Does your hospital/healthcare service use any of the following (either national or local) guidelines? (tick all that apply)
 {[guidelines] checkbox}

- ☐ {1} Empiric antibiotic choice for different infections
☐ {2} Sepsis management
☐ {3} Antibiotics for neonates
☐ {4} Antibiotics in oncology (especially febrile neutropenia)
☐ {5} Antibiotics for surgical prophylaxis
☐ {6} Different strategies for community-acquired and hospital-acquired infections

Has your hospital antibiotic guideline been developed in line with the WHO Integrated Management of Childhood Illness (IMCI) guide?
 {[imci] radio}

- ☐ {1} Yes/mostly
☐ {2} No
☐ {3} Unsure but I have heard of it
☐ {4} Unsure and I hadn't heard of it before reading this question

Matrix question on AMS/ID interventions: Outside of regular ward rounds by the primary patient team, which point of care interventions occur for PAEDIATRIC patients at your hospital? (e.g. by AMS rounds/ID consults)

	{1} Frequently	{2} Sometimes	{3} Rarely/never	{4} Unknown
Review of antimicrobial choice {[review_choice] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dose optimisation {[optimise_dose] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Change from empiric to narrow-spectrum choice based on microbiology results {[de_escalate] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IV to oral switch {[iv_po_switch] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Setting maximum duration of treatment {[max_duration] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Antibiotic availability

Before you had read this question, had you heard of the WHO AWaRe classification of antibiotics?
 {[who] radio}

- ☐ {1} Yes
☐ {2} No
☐ {3} Unsure

For empiric first-line use of antibiotics, ie for patients presenting to healthcare with a presumed infection, the WHO recommends the Access antibiotics (listed to the right).

Does your hospital/healthcare service use only use these antibiotics for EMPIRIC FIRST-LINE treatment (excluding patients with known resistance where a specific empiric plan has been made)?
 {[empiric] radio}

- ☐ {1} Yes - we only use those for empiric first-line treatment
☐ {2} No - we use others
☐ {3} Unknown
 (Amikacin, Amoxicillin, Amoxicillin+clavulanic acid, Ampicillin, Benzylpenicillin, Cefalexin, Cefazolin, Chloramphenicol, Clindamycin, Cloxacillin/Flucloxacillin, Doxycycline, Gentamicin, Metronidazole, Nitrofurantoin, Phenoxymethylpenicillin (Penicillin V), Spectinomycin, Trimethoprim/sulfamethoxazole)

If your hospital uses other antibiotics for EMPIRIC FIRST-LINE treatment, what are they and for which indications?

{[empiric_other] textarea}

{Branching logic (show if): [empiric] = '2'}

Before you had read this question, had you heard of the ANZPID antibiotic duration and IV-oral switch guideline?

{[anzpid] radio}

☐ {1} Yes

☐ {2} No

☐ {3} Unsure

Matrix question on antibiotic availability for children.

Does your hospital/healthcare service always have availability of the following:

	{1} Always	{2} Mostly	{3} Frequently not/some choices not at all	{4} Unknown
All the WHO 'Access' antibiotics (see question above) {[ab_avail_access] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broad antibiotics for treating very resistant bacteria {[ab_avail_broad] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
IV antibiotics {[ab_avail_iv] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Antimicrobial approval

Does your hospital/healthcare service have any system for restricting the use of broad-spectrum/expensive antibiotics?

{[approval] radio}

☐ {1} Yes

☐ {2} No

☐ {3} Unknown

If yes, does the system work?

{[approval_yes_works] radio}

{Branching logic (show if): [approval] = '1'}

☐ {1} Mostly

☐ {2} Sometimes

☐ {3} Not really

What is the system that your hospital uses?
(tick all that apply)

{[approval_yes_describe] checkbox}

{Branching logic (show if): [approval] = '1'}

- ☐ {1} List of restricted antibiotics to be aware of, but no actual restriction process
- ☐ {6} List of restricted antibiotics with a process for seeking approval to prescribe
- ☐ {2} Limiting prescribing of restricted antibiotics to certain physicians (eg named or a designated level of seniority)
- ☐ {4} Regular audits of restricted drug use and accountability to hospital management
- ☐ {5} Other

If other, what else?

{[approval_no] text}

{Branching logic (show if): [approval_yes_describe(5)] = '1'}

Does your hospital/healthcare service conduct audits of antibiotic use for PAEDIATRIC (including neonatal) patients?
 {[audit] radio}

- ☐ {1} Yes, at least annually
☐ {2} Yes, but less than annually
☐ {3} No
☐ {4} Unknown

Barriers to antimicrobial stewardship

Which of the following barriers to AMS for the PAEDIATRIC patient population have you encountered at your hospital?
 (Please tick all that apply)
 {[barriers_ams] checkbox}

- ☐ {1} Lack of education about antibiotics
☐ {2} Lack of support from senior doctors that this is a problem that really matters
☐ {3} Lack of support and enforcement from management at the hospital
☐ {4} Lack of specialised Infectious Diseases services
☐ {5} Lack of a Microbiology lab (or components such as susceptibility testing)
☐ {6} Lack of pharmacy resources
☐ {9} Lack of enough antibiotic choices to make the best decisions
☐ {10} Not enough staff to address this as a priority
☐ {7} High level of transient/seconded staff
☐ {8} Other

If other barriers, please describe

{[barriers_ams_other] text}

{Branching logic (show if): [barriers_ams(8)] = '1'}

What do you think is the SINGLE MOST significant barrier to AMS for the PAEDIATRIC population at your hospital?

{[barriers_ams_rank] text}

Antimicrobial stewardship priorities

What do you think are the top 3 priorities for practical/clinical implementation of AMS in low and middle income countries?

{[ams_priorities_clinical] textarea}

What do you think are the top 3 priorities for research in AMS in low and middle income countries?

{[ams_priorities_research] textarea}

Microbiology

(You may wish to consult your friendly Microbiology department for assistance with these questions)

Are you able to do microbiology cultures at your hospital?

{[blood_cultures] radio}

- ☐ {1} Yes, we have a microbiology laboratory on site
☐ {2} Yes, but we have to send to an off site laboratory
☐ {5} Yes, but there are restrictions on which patients/samples to test because of capacity/cost
☐ {3} No
☐ {4} Unknown

Is there a bacterial culture service for: (tick all that apply) {[culture_types] checkbox} {Branching logic (show if): [blood_cultures] = '1' or [blood_cultures] = '2' or [blood_cultures] = '5'}	<input type="checkbox"/> {1} Blood <input type="checkbox"/> {2} CSF <input type="checkbox"/> {3} Urine <input type="checkbox"/> {4} Stool <input type="checkbox"/> {5} Pus
How long does it usually take for positive blood culture results to be notified to clinicians? {[micro_review] radio} {Branching logic (show if): [culture_types(1)] = '1'}	<input type="radio"/> {1} Within 24 hours <input type="radio"/> {2} 24-48 hours <input type="radio"/> {3} Over 48 hours
With your culture results, do you get results of antibiotic susceptibility testing? {[susceptibility] radio} {Branching logic (show if): [blood_cultures] = '1' or [blood_cultures] = '2' or [blood_cultures] = '5'}	<input type="radio"/> {1} Always/usually <input type="radio"/> {2} Restricted to specific sample types or patient groups <input type="radio"/> {3} Occasionally/never
Does your microbiology service have a system for 'cascade reporting' of antimicrobial susceptibilities? {[cascade_report] radio} {Branching logic (show if): [blood_cultures] = '1' or [blood_cultures] = '2' or [blood_cultures] = '5'}	<input type="radio"/> {1} Yes <input type="radio"/> {2} No <input type="radio"/> {3} Unknown (Cascade reporting = when certain broad-spectrum antimicrobial sensitivities are withheld because the organism is also sensitive to a narrow-spectrum agent)
Do patients self-fund microbiological investigations? {[self_fund] radio}	<input type="radio"/> {1} Yes <input type="radio"/> {2} No <input type="radio"/> {5} Partially/sometimes <input type="radio"/> {3} Unsure <input type="radio"/> {4} Not applicable as there aren't any
Are there periodic updates of local bacterial sensitivity patterns (antibiograms)? {[antibiogram] radio}	<input type="radio"/> {1} Yes <input type="radio"/> {2} No <input type="radio"/> {3} Unknown
Do you know the approximate percentage of all invasive Staphylococcus aureus isolates (eg in blood culture or CSF) at your hospital/healthcare service that are MRSA {[gp_resistance] text}	_____
Do you know the approximate percentage of all invasive (eg in blood culture or CSF) Gram-negative isolates at your hospital/healthcare service that are multi-resistant? {[gn_resistance] text}	_____ (ie resistant to two or more classes of drugs that they used to be sensitive to eg 3rd generation cephalosporins and ciprofloxacin; may be ESBL or CPE but don't have to be)
As resistance increases, does your hospital/healthcare service have a strategy to address this? {[resistance_strategy] radio}	<input type="radio"/> {1} Yes <input type="radio"/> {2} No <input type="radio"/> {3} Unknown
If yes, what is it? {[resistance_strategy_yes] text} {Branching logic (show if): [resistance_strategy]='1'}	_____

Infection prevention and control

Do you have a formal Infection Prevention & Control program/team at your hospital/healthcare service? (This means a usually multidisciplinary team specifically following up hospital-acquired infections, implementing and auditing infection control strategies, etc. It is more than just receiving a hospital memo about hand washing.)
{[ic_team] radio}

- ☐ {1} Yes - formally includes paediatric patients
☐ {2} Yes - but adult-focused
☐ {3} In development
☐ {4} No
☐ {5} Unknown

Who is on the Infection Control team?
{[ic_personnel] checkbox}
{Branching logic (show if): [ic_team] = '1'}

- ☐ {1} Paediatric ID physician
☐ {2} Adult ID physician
☐ {3} Epidemiologist/Non-clinical public health person
☐ {4} Infection control nurse/Infection preventionist
☐ {5} Microbiologist
☐ {6} Paediatrician

Matrix question on infection control interventions: Which interventions occur for PAEDIATRIC patients at your hospital/healthcare service? (eg by infection control nurses)

	{1} Frequently	{2} Sometimes	{3} Rarely/never	{4} Unknown
Promote hand hygiene with education and/or posters {[ic_activity_hand] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Audit hand hygiene practices {[ic_activity_audit] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide personal protective equipment {[ic_activity_ppe] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perform surveillance of healthcare-associated infections {[ic_activity_hai] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perform surveillance for resistant infections {[ic_activity_resist] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Manage outbreaks of infections {[ic_activity_outbreak] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensure healthcare worker vaccination before they start the job {[ic_activity_pre_vacc] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Healthcare worker vaccination during seasonal outbreaks {[ic_activity_flu_vacc] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which infection-specific control practices does your hospital/healthcare service do?
(tick all that you are aware of)
{[ic_infections] checkbox}

- ☐ {1} Cohort patients with the same infection (ie put them together in the same room)
☐ {2} Use respiratory precautions for viral respiratory infections
☐ {3} Use contact precautions for resistant bacteria
☐ {4} Isolate patients with some contagious infections (eg TB)
☐ {5} Do contact tracing for some infections and vaccinate staff and/or patients (eg measles)
☐ {6} None of the above

Matrix question on infection control intervention availability. Does your hospital have access to the following:

	{1} Always	{2} Mostly	{3} Sometimes/Never	{4} Unsure
Sinks near patient beds {[avail_sinks] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A reliable and continuous water supply for handwashing {[avail_water] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcohol hand gel/antiseptic near patient beds {[avail_gel] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disposable gloves {[avail_gloves] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Full personal protective equipment as required {[avail_ppe] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Boxes for used sharps near blood-taking {[avail_sharps] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Daily cleaning in patient areas {[avail_clean] radio}	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Does your hospital/healthcare facility reuse any of the following equipment:
(tick all that apply)
{[equip_reuse] checkbox}

- ☐ {1} Syringes
☐ {2} Endotracheal tubes
☐ {3} Nasal prongs
☐ {4} Oxygen masks
☐ {5} Nasogastric tubes
☐ {6} PPE

If any of these are reused, is there a protocol for cleaning them?
{[equip_clean] radio}
 {Branching logic (show if): [equip_reuse(1)] = '1' or [equip_reuse(2)] = '1' or [equip_reuse(3)] = '1' or [equip_reuse(4)] = '1' or [equip_reuse(5)] = '1'}

- ☐ {1} Yes for all
☐ {2} For some, not others
☐ {3} None
☐ {4} Unsure

If yes, do you know what the cleaning consists of?
{[equip_clean_yes] text}
 {Branching logic (show if): [equip_clean] = '1' or [equip_clean] = '2'}

Does your hospital maintain a minimum distance between
paediatric beds/neonatal cots?
{[distance_1] radio}

- ☐ {1} Yes
☐ {2} No
☐ {3} Unsure

If yes, do you know what it is?
{[distance_2] text}

Do medical and nurses use mobile phones during patient
care?
{[phone] radio}

- ☐ {1} Yes a lot
☐ {2} Yes occasionally
☐ {3} No

Barriers to infection control

Which of the following barriers to infection control
for the PAEDIATRIC patient population have you
encountered at your hospital?
(Please tick all that apply)
{[barriers_ic] checkbox}

- ☐ {1} Lack of education about infection control
☐ {2} Lack of support from senior clinicians at the
hospital to change practice
☐ {3} Lack of support and enforcement from
management at the hospital
☐ {4} Lack of specialised Infectious Diseases
services
☐ {5} Lack of a Microbiology lab (or components such
as susceptibility testing)
☐ {6} Lack of infection nurse/preventionist resources
☐ {9} Lack of basic equipment/consumables
☐ {10} Not enough staff to address this as a priority
☐ {7} High level of transient/seconded staff
☐ {8} Other

If other, please describe
{[barriers_ic_other] text}
{Branching logic (show if): [barriers_ic(8)] = '1'}

What do you think is the SINGLE MOST significant
barrier to infection control for the PAEDIATRIC
population at your hospital/healthcare service?
{[barriers_ic_rank] text}

Infection prevention & control priorities

What do you think are the top 3 priorities for
practical/clinical implementation of infection control
in low and middle income countries?
{[ic_priorities_clinical] textarea}

What do you think are the top 3 priorities for
research in infection control in low and middle income
countries?
{[ic_priorities_research] textarea}

Education about antibiotic use and infection control in children

Is there any REGULAR or REQUIRED education specifically on best practice in antimicrobial prescribing at your hospital/healthcare service?

- ☐ {1} Yes
☐ {2} Occasional/patchy
☐ {3} No

{[education_ams] radio}

Can you give an indication of the highest frequency of this antibiotic education?

{[education_ams_freq] radio}

- ☐ {1} At least monthly
☐ {2} At least 2-4 times a year
☐ {3} At least yearly
☐ {4} Less than yearly
☐ {5} Just at starter orientation
☐ {6} Just when the hospital is undergoing accreditation
☐ {7} Never

Is there any REGULAR or REQUIRED education specifically on best practice in infection control at your hospital/healthcare service?

{[education_ic] radio}

- ☐ {1} Yes
☐ {2} Occasional/patchy
☐ {3} No

Can you give an indication of the highest frequency of this infection control education?

{[education_ic_freq] radio}

- ☐ {1} At least monthly
☐ {2} At least 2-4 times a year
☐ {3} At least yearly
☐ {4} Less than yearly
☐ {5} Just at starter orientation
☐ {6} Just when the hospital is undergoing accreditation
☐ {7} Never

Are you aware of any public health campaigns or messaging around antibiotic use or infection control aimed at the general public in your country?

{[messaging] radio}

- ☐ {1} Yes
☐ {2} No
☐ {3} Unsure

If yes, what are they?

{[messaging_detail] text}

{Branching logic (show if): [messaging] = '1'}

Are antibiotics used to increase the growth of food-providing animals in your country, as far as you are aware?

{[animals] radio}

- ☐ {1} Yes
☐ {2} No
☐ {3} Unsure

Do you have any other final comments?

{[comments] textarea}

Thank you. Please provide your email address, if you wish to, so we can acknowledge your contribution when this is published.

{[end] text}
