The Philippine Action Plan to Combat Antibiotic Resistance: One Health Approach

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Research Institute for Tropical Medicine, Department of Health
The problem of Antimicrobial Resistance

• AMR definition - resistance of a microorganism to an antimicrobial medicine to which it was originally sensitive

• Widespread overuse and inappropriate use of antimicrobials is fuelling an increase in antimicrobial-resistant organisms.
“The more we use them, the more we lose them”

From Albrich et al EID 2004
Antimicrobial use covers both human and animal usage
AMR effect on patient outcome and economic impact

- **European Union**
  - 2.5 million extra hospital days in 2007
  - 25,000 deaths per year
  - Overall societal costs about 1.5 billion Euros per year

- **Thailand**
  - > 40,000 AMR infected patients per year
  - >30,000 deaths from blood infection
  - 2.0 billion USD per year

- **USA**
  - > 2,049,442 illnesses & > 23,000 deaths
  - Up to $ 20 billion direct costs
  - Up to $ 35 billion additional indirect costs
Deaths attributable to AMR every year compared to other major causes of death

- AMR in 2050: 10 million
- AMR now: 700,000 (low estimate)
- Cancer: 8.2 million
- Cholera: 100,000–120,000
- Diabetes: 1.5 million
- Diarrhoeal disease: 1.4 million
- Measles: 130,000
- Road traffic accidents: 1.2 million
- Tetanus: 60,000

Deaths attributable to AMR every year by 2050

- Europe: 390,000
- North America: 317,000
- Africa: 4,150,000
- Latin America: 392,000
- Asia: 4,730,000
- Oceania: 22,000

Mortality per 10,000 population

AMR’s impact on World GDP in trillions of USD

Total GDP loss
$100.2 trillion

New antibiotics are scarce

Over the last 30 years, no major new types of antibiotics have been developed

1st report by WHO summarising globally collected data on current situation on AMR for selected pathogens

April 2014

- High proportions of resistance to common treatments reported in all regions
### Bacteria commonly causing infections in hospitals and in the community

<table>
<thead>
<tr>
<th>Name of Bacterium / Resistance</th>
<th>Examples of typical diseases</th>
<th>No. out of 194 Member States Providing Data</th>
<th>No. of WHO Regions with National Reports of 50% Resistance or More</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vs. 3(^{rd}) gen. cephalosporins</td>
<td>Urinary tract infections, blood stream infections</td>
<td>86</td>
<td>5/6</td>
</tr>
<tr>
<td>Vs. fluoroquinolones</td>
<td></td>
<td>92</td>
<td>5/6</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vs. 3(^{rd}) gen. cephalosporins</td>
<td>Pneumonia, blood stream infections, urinary tract infections</td>
<td>87</td>
<td>6/6</td>
</tr>
<tr>
<td>Vs. carbapenems</td>
<td></td>
<td>71</td>
<td>2/6</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vs. methicillin “MRSA”</td>
<td>Wound infections, blood stream infections</td>
<td>85</td>
<td>5/6</td>
</tr>
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Bacteria mainly causing infections in the community

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<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-susceptible or resistant to penicillin</td>
<td>Pneumonia, meningitis, otitis</td>
<td>67</td>
<td>6/6</td>
</tr>
<tr>
<td><em>Nontyphoidal Salmonella</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vs. fluoroquinolones</td>
<td>Foodborne diarrhea, bloodstream infections</td>
<td>68</td>
<td>3/6</td>
</tr>
<tr>
<td><em>Shigella species</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vs. fluoroquinolones</td>
<td>Diarrhea (&quot;bacillary dysenteria&quot;)</td>
<td>35</td>
<td>2/6</td>
</tr>
<tr>
<td><em>Neisseria gonorrhoeae</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vs. 3rd gen. cephalosporins</td>
<td>Gonorrhea</td>
<td>42</td>
<td>3/6</td>
</tr>
</tbody>
</table>
Yearly penicillin, oxacillin and vancomycin resistance rates of *Staphylococcus aureus*, ARSP, 2005-2014
Trends of resistance for *Neisseria gonorrhoeae*, ARSP, 2005 - 2014

![Graph showing trends of resistance for Neisseria gonorrhoeae from 2005 to 2014. The graph compares the percentage of resistance for Ciprofloxacin, Penicillin, and Tetracycline over the years.](image)
Percentage of ESBL suspect (ceftriaxone resistant) *Escherichia coli*, ARSP, 2014

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>BGH</td>
<td>11.2%</td>
</tr>
<tr>
<td>BRH</td>
<td>40%</td>
</tr>
<tr>
<td>BRT</td>
<td>28.2%</td>
</tr>
<tr>
<td>CMC</td>
<td>24.6%</td>
</tr>
<tr>
<td>CVM</td>
<td>33.3%</td>
</tr>
<tr>
<td>DMC</td>
<td>30.3%</td>
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<tr>
<td>EVR</td>
<td>18.5%</td>
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<tr>
<td>FEU</td>
<td>15.5%</td>
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<tr>
<td>GMH</td>
<td>20.9%</td>
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<tr>
<td>JLM</td>
<td>16.3%</td>
</tr>
<tr>
<td>LCP</td>
<td>33.3%</td>
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<tr>
<td>MAR</td>
<td>25.8%</td>
</tr>
<tr>
<td>MMH</td>
<td>27.9%</td>
</tr>
<tr>
<td>NKI</td>
<td>15.6%</td>
</tr>
<tr>
<td>NMC</td>
<td>31.6%</td>
</tr>
<tr>
<td>PGH</td>
<td>26.3%</td>
</tr>
<tr>
<td>RTM</td>
<td>9.4%</td>
</tr>
<tr>
<td>SLH</td>
<td>66.7%</td>
</tr>
<tr>
<td>UST</td>
<td>51.6%</td>
</tr>
<tr>
<td>VSM</td>
<td>24.8%</td>
</tr>
<tr>
<td>ZMC</td>
<td>37.9%</td>
</tr>
</tbody>
</table>

Numbers in the chart represent counts or measurements associated with each hospital.
Yearly ciprofloxacin and ceftriaxone resistance rates of nontyphoidal *Salmonellae*, ARSP, 2005-2014
Yearly ciprofloxacin, imipenem and meropenem resistance rates of Acinetobacter baumannii, ARSP, 2005 - 2014
AMR as a Global Public Health threat

- AMR kills
- AMR hampers the control of infectious diseases
- AMR increases the costs of health care
- AMR jeopardizes health care gains to society
- AMR has the potential to threaten health security, and damage trade and economy

WHO fact sheet, 2011
FIRST World Antibiotic Awareness Week

BE PART OF THE FIRST WORLD ANTIBIOTIC AWARENESS WEEK

16-22 November 2015

AAW 2015
Antibiotic Awareness Week

ANTIBIOTICS: HANDLE WITH CARE
Factors that Contribute to AMR In the Human sector

HEALTHCARE PROVIDERS
Inappropriate treatment regimens
- Absence of guidelines
- Noncompliance with guidelines
- Lack of training
- No treatment monitoring
- Poor infection control practices

INDUSTRY
Poor integrity of the supply chain
- Poor quality of drugs
- Unavailability of drugs
- Poor storage conditions
- Wrong dose or combinations
- High drug costs

PATIENTS
Irrational drug use
- Poor adherence
- Prescription-sharing
- Self prescription
- Treatment interruptions
- Social and Economic Barriers
- Health illiteracy

AMR
WHO Six-Point Policy Package to Combat AMR

Policy Areas

(1) Committing to develop a master plan to combat antimicrobial resistance

(2) Strengthening surveillance and laboratory capacity

(3) Ensuring uninterrupted access to essential medicines of assured quality

(4) Promoting rational use of medicines in patient care and animal husbandry

(5) Enhancing infection prevention and control

(6) Fostering innovations and research to develop new tools and drugs

During the 62nd WHO regional Committee Meeting in October 2011, the Philippines committed to implementing the six-point policy agenda to combat AMR
Worldwide country situation analysis: response to antimicrobial resistance

April 2015
KEY FINDINGS

• Comprehensive national plan
  Only a few countries reported having a comprehensive national plan based on a multisectoral approach and with sustainable financing.

• Laboratory capacity to undertake surveillance
  In many, poor laboratory capacity, infrastructure and data management prevented effective surveillance.

• Access to safe, effective antimicrobials
  Higher access rates in high-income countries; in regions with problems of low-quality and/or counterfeit medicines, few countries had a national regulatory authority, national standards or the capacity to enforce them.
KEY FINDINGS

• Control of misuse of antimicrobials
  Widespread sale of antimicrobials without prescription; regulations not enforced
  No standard treatment guidelines for health care workers in many countries
  Few countries w/ a system for monitoring antimicrobial usage

• Awareness and understanding among the general public
  Public awareness generally low; also low in sectors of healthcare, politics, media and academia

• Effective IPC programs
  Less than half had a national IPC program; fewer had IPC programs in all tertiary hospitals
Goal

The overall goal is to ensure, for as long as possible, continuity of the ability to treat and prevent infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them.
WHO GLOBAL ACTION PLAN ON ANTIMICROBIAL RESISTANCE 2015

Objectives

• Improve awareness and understanding of antimicrobial resistance through effective communication, education and training
• Strengthen the knowledge and evidence base through surveillance and research
• Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures
Objectives

• Optimize the use of antimicrobial medicines in human and animal health
• Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines and other interventions
## Country Situation Analysis on AMR, Philippines (2012)

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>No comprehensive national plan</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Need to improve surveillance</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Securing the drug supply chain</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Need for positive changes in knowledge and practices of prescribers, dispensers and patients</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Strengthen sanitation, infection control and prevention</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Research on discovery and development</td>
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</table>
Administrative Order
no. 42 s. 2014

Creating an **Inter-Agency Committee** for the **National Plan to Combat Antimicrobial Resistance** in the Philippines
Administrative Order
no. 42 s. 2014

Creating an **Inter-Agency Committee** for the Formulation and Implementation of the **National Plan to Combat Antimicrobial Resistance** in the Philippines

- **ICAMR**

  **Co-Chairs:** Department of Health

  Department of Agriculture

  **Members:** Department of Science and Technology

  Department of Interior and Local Government

  Department of Trade and Industry
The Philippine Action Plan to Combat Antimicrobial Resistance: One Health Approach
Philippine Action Plan to Combat AMR: One Health Approach

• 3-year comprehensive plan
• Emphasis on “One Health Strategy”
  ▫ The causation of AMR is inter-related and inter-sectoral thereby requiring collaborative multidisciplinary work at local, national, and global levels to attain optimal health for humans, animals and the environment
Philippine Action Plan to Combat AMR: One Health Approach

Vision

A nation protected against the threats of antimicrobial resistance

Mission

To implement an integrated, comprehensive and sustainable national program to combat AMR geared towards safeguarding human and animal health while preventing interference in the agricultural, food, trade, communication and environmental sectors
**Philippine Action Plan to Combat AMR: One Health Approach**

<table>
<thead>
<tr>
<th>Philippine Targets to Combat Antimicrobial Resistance</th>
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<tbody>
<tr>
<td><strong>By 2020, the Philippines will:</strong></td>
</tr>
<tr>
<td>1. Reduce by 30% carbapenem-resistant Enterobacteriaceae (E. coli and Klebsiella) infections acquired during hospitalization</td>
</tr>
<tr>
<td>2. Maintain the prevalence of ceftriaxone-resistant Neisseria gonorrhoeae to 0%</td>
</tr>
<tr>
<td>3. Reduce by at least 30% overall methicillin resistance in Staphylococcus aureus bloodstream infections compared to rates in 2014</td>
</tr>
<tr>
<td>4. Reduce by 30% multidrug-resistant Pseudomonas spp infections acquired during hospitalization compared to estimates in 2014</td>
</tr>
<tr>
<td>5. Reduce by 25% ciprofloxacin-resistant non-typhoidal salmonella infections compared to 2014</td>
</tr>
</tbody>
</table>
Commit to a comprehensive, financed national plan with accountability and civil society engagement

Ensure uninterrupted access to essential medicines of assured quality

Regulate and promote rational use of medicines in the human and animal health sectors and ensure proper patient care

Enhance infection prevention and control across all settings

Foster innovations and research and development

Development of a Risk Communication Plan to combat AMR
Key Strategy 01: Commit to a Comprehensive, Financed National Plan with Accountability and Civil Society Engagement

Objectives (Human and Animal Health)

1. To forge a joint action plan and agreement among national agencies
2. To generate resources and enhance internal/external networking
Launch of Phil Action Plan during First AMR Summit, November 24-25, 2015
Key Strategy 02: Strengthen Surveillance and Laboratory Capacity

Objectives (Human Health)

1. To improve surveillance capacity of health personnel, hospitals and laboratories
   - Assessment and inventory
   - Training
   - Management of the Nat’l. Health Lab Referral Network (gov’t. & private labs)
   - Implementation of HAI surveillance in hospitals
   - Expansion of ARSP to other DOH-retained hospitals
Key Strategy 02: Strengthen Surveillance and Laboratory Capacity

Objectives (Human Health)

2. To develop programs and systems for surveillance and monitoring of AMR
   - Antimicrobial use surveillance (AMU) system
   - Integrated system for AMR, AMU and HAI
   - IT platform
Key Strategy 03: Ensure uninterrupted access to essential medicines of assured quality

Objectives (Human Health)

1. To improve the registration, marketing authorization and post marketing surveillance of antimicrobials
   - Monitoring quality of registered antimicrobials
   - **Streamlining review/release of marketing authorization of antibiotics for priority infections**
   - Forging an agreement on regulatory control over drugs used in aqua culture
   - Rationalization and harmonization of regulatory control over manufacture/use of antibiotics in animals
Objectives (Human Health)

2. To ensure access to essential medicines
   - Strict enforcement of regulations on antibiotic prescription, dispensing and use
   - Review of issuances on access to antimicrobials
   - Partnerships with HC professionals, orgs, consumer group
Key Strategy 04: Regulate and promote the rational use of medicines in the human and animal health sectors

Objectives (Human Health)

- **Strict regulation of promotion and marketing**
- **Philippine Practice Standards for Pharmacists in relation to Rational Dispensing of Antimicrobials**
- **National Antibiotic Guidelines dev’t./implementation**
- **Antimicrobial Stewardship Program in Hospitals**
Key Strategy 04: Regulate and promote the rational use of medicines in the human and animal health sectors

Objectives (Human Health)

- Inclusion of RUM principles in educational curricula
- Training/Dissemination of National Treatment Guidelines
- Coordination meetings and workshops with local government on policies implementation
DOH AMS action planning: Interactive workshops

Five essential strategies

- implementing clinical guidelines
- establishing formulary restrictions
- reviewing antimicrobial prescribing with intervention and direct feedback
- monitoring performance
- ensure selective reporting of susceptibility testing results.
Draft Administrative Order on AMS

Republic of the Philippines
DEPARTMENT OF HEALTH
OFFICE OF THE SECRETARY

DRAFT AS OF JANUARY 27, 2016

ADMINISTRATIVE ORDER
No. 2016-____

SUBJECT: Guidelines on the Implementation of the Philippine Antimicrobial Stewardship (AMS) Program among Hospitals

I. RATIONALE

Infectious diseases kill millions of people around the world, 85% of them live in resource-constrained settings. In the 1940s, the discovery of antimicrobials revolutionized man’s ability to treat infectious diseases through these life-saving drugs. However, only for a few decades later, health practitioners across the globe cannot longer expect that all these agents work.

Antimicrobial resistance (AMR) has become common in clinical and community settings. AMR became a significant public health threat that causes major health and economic consequences both in human and veterinary health as it claims lives, prolongs illnesses, increases healthcare costs and financial burden and affects trade as well as national and global security.

In 2009, the Health Facilities Development Bureau (formerly the National Center for Health Facilities) of the Department of Health (DOH) published the National Standards in Infection Control for Healthcare Facilities to strengthen infection control programs nationwide and prevent the occurrence of healthcare-associated infections (HAIs) among patients. Its purpose is to serve as a guide and reference for hospital management, service providers, and support staff to capacitate them in providing quality service at various aspects of work and service delivery points in the hospital.

Infection control standards on rational antibiotic use and monitoring antimicrobial resistance patterns were identified as an important component of an effective infection control program.

In the Philippines, the Antimicrobial Resistance Surveillance Program (ARSP) found very alarming rates of resistance among various pathogens. For Escherichia coli, Klebsiella spp., extended-spectrum beta-lactamases (ESBL) enzymes have been found rendering them resistant to many antibiotics. Multi-drug resistant Pseudomonas aeruginosa and Acinetobacter spp., which account for 63% of all hospital-acquired infections (HAIs) have already been identified.

Streptococcus pneumoniae, a causative agent of acute respiratory infections (ARI), showed increasing resistance to penicillin at 5% (95% CI: 3.2-9) in 2013 from 0% in 2010 and 4% in 2011. These are other very alarming developments in AMR in the Philippines. One is the steady increase in the resistance rates of Staphylococcus aureus, elevating the prevalence of methicillin-resistant Staphylococcus aureus which is also an important cause of HAI and other community-acquired infections. Second is the high resistance rates of Nesterovia genomos to ciprofloxacin (74%), ofloxacin (70%), and to tetracyclines (33%).

Many of the causative bacterial pathogens of infections in the top (10) leading causes of morbidity in the country have also acquired multiple drug resistance. In the forefront is tuberculosis (TB), for which multi-drug resistant TB (MDR-TB) and extensively drug-resistant TB (MDR-XDR-TB) are significant threats.
AO on Pharmaceutical promotion

Specific Objective: To prescribe standards, guidelines, and regulations with respect to information dissemination, advertisements, promotion, sponsorship, and other marketing activities and instruments about prescription pharmaceutical products and medical devices with the end goal of improving and promoting their rational use, and safeguarding patient rights and welfare.

Takes effect 15 days after publication
In 2 newspapers of natl circulation.
Key Strategy 05: Enhance infection prevention and control across all settings

Objectives (Human Health)

1. Improve capacity of health personnel and community
   - Dev’t. of National Policy on IPC
   - IPC promotion and education in the community
   - Training of hospital personnel

2. Implement and monitor programs on IPC
Administrative Order on Infection control

General objective: To provide guidance for the establishment and effective implementation of the core components of Infection Prevention and Control in healthcare facilities.

The AO takes effect immediately
Key Strategy 06: Foster innovations, research and development

Objectives (Human Health)

1. Prioritize AMR in fields of research
   - Inclusion of AMR in NUHRA and eHealth development plan
   - Develop AMR research agenda
   - Provide incentive and funding for innovators

2. Disseminate scientific information relevant to AMR
Key Strategy 07: Development of a risk communication plan to combat AMR

Objectives (Human Health)

1. To develop a targeted risk communication plan in AMR
   - Risk communication plan
   - IEC materials
   - Advocacy
   - AO for AMR Awareness Month
Examples of IEC Materials developed by ICAMR

HOW DOES ANTIBIOTIC RESISTANCE SPREAD?

- Antibiotics are only used to treat infections. Irrational drug use contributes to the emergence of resistant organisms which threatens the health of animals and humans.
- Drug-resistant bacteria in animal feces can remain in crops and be eaten. These can remain in the stomach of humans.
- Drug-resistant bacteria can remain on the meat of animals. This can be transferred to humans when food is not properly cooked.
- Antibiotics are used in hospitals, nursing homes, or inpatient facilities.
- Patients go home.

Examples of IEC Materials developed by ICAMR

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THE CENTRAL ROLE OF DOCTORS (specially ID doctors) IN ANTIBIOTIC STEWARDSHIP

Slides courtesy of Regina Berba MD
1) Every **DOCTOR** is a **PRESCRIBER**: Individually an integral part of the Solution

CHALLENGES WHICH NEED TO BE ADDRESSED:

- Inappropriate use when not indicated
- Broad spectrum
- Unnecessary prolonged duration
- Wrong dosing
- Wrong drug
- No de-escalation
- No microbiologic studies/cultures
Antibiotic resistance happens when bacteria change and become resistant to the antibiotics used to treat the infections they cause. This is compromising our ability to treat infectious diseases and undermining many advances in medicine.

We must handle antibiotics with care so they remain effective for as long as possible.

**WHAT HEALTH WORKERS CAN DO**

1. Prevent infections by ensuring your hands, instruments and environment are clean
2. Keep your patients’ vaccinations up to date
3. If you think a patient might need antibiotics, where possible, test to confirm and find out which one
4. Only prescribe and dispense antibiotics when they are truly needed
5. Prescribe and dispense the right antibiotic at the right dose for the right duration

www.who.int/drugresistance

#AntibioticResistance
2) **DOCTORS**: Significant coach of patients towards prudent antibiotic use

- Pervasive practice of self-medication, and purchase of antimicrobials without doctor’s prescription
- Patients and caregivers generally consider antibiotics to be relatively risk-free and are often not troubled by considerations of under treatment or development of resistant organisms
- Widespread self-treatment often with the *least effective agent in an incorrect dosage*
- Local practice of recycling prescriptions and prescription sharing among friends, neighbours and relatives.
- Widespread lack of patient awareness that drug regimens should be completed
3) **ID DOCTORS** LEAD HOSPITAL RESPONSE to AMR PROBLEM
The Antibiotic Stewardship Programs of Hospitals will be driven by ID DOCTORS.

4) ID DOCTORS THRU PROFESSIONAL SOCIETIES DEVELOP GUIDELINES

- UTI
- PNEUMONIA
- TUBERCULOSIS
- HIV
- TYPHOID FEVER
- LEPTOSPIROSIS
- SURGICAL PROPHYLAXIS
5) **ID DOCTORS HAVE KEY ROLE IN TEACHING OTHER DOCTORS**
6) **DOCTORS as RESEARCHERS** help look for innovative solutions to address AMR

**Take home message:** *Every doctor* should do his share to:

**WIN THE WAR AGAINST AMR**
Acknowledgements

• Dr. Mediadora Saniel and Dr. Regina Berba for sharing their slides