

Canadian Program for Antimicrobial Resistance Surveillance - Successes

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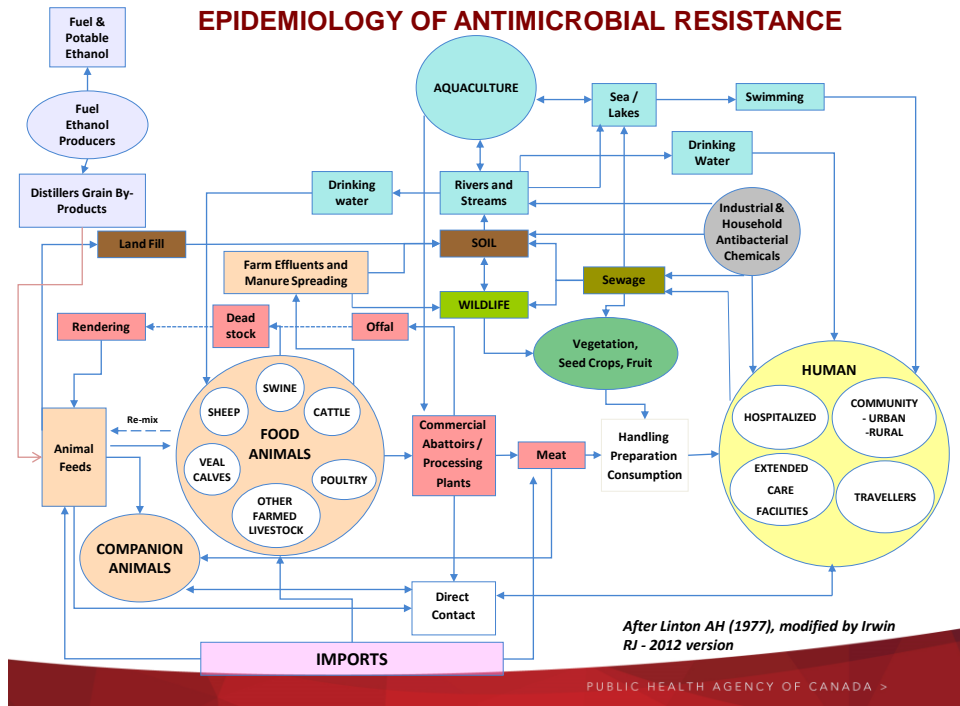
1

CIPARS

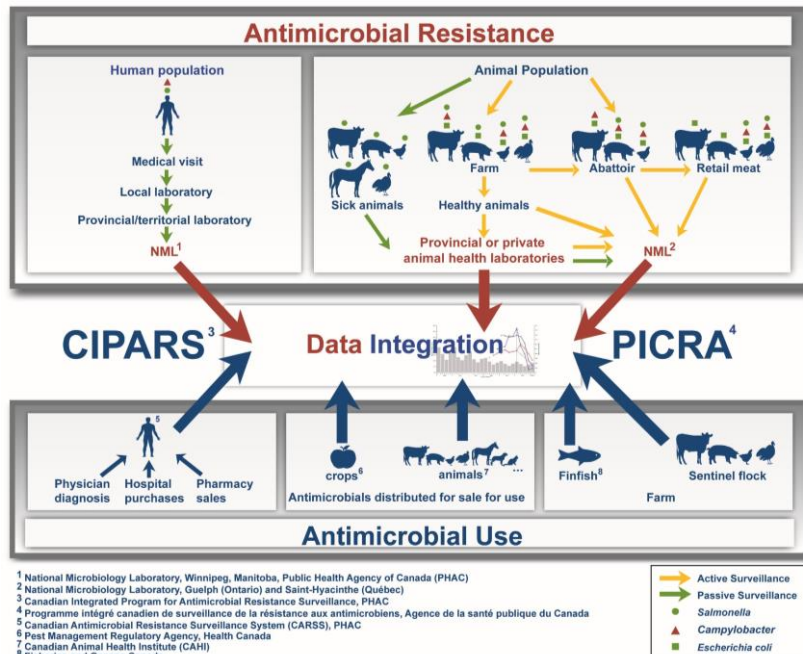
Successes

- We survived!
 - Amid changing departments
 - Amid changing directorates
 - Amid changing priorities and severe budget cuts
- We built a 'made in Canada' robust sustainable system
 - Strong epidemiological foundation, active and passive component driven, collaborative, flexible, meeting multiple stakeholder needs
 - Links well with stewardship and research directions
 - Strong methodological development for AMU reporting
- We are recognized internationally as a model system for integrated surveillance of AMR and AMU
 - WHO, FAO, CODEX, TATFAR
- Fits well with new priorities under Pan Canadian Action Plan to address surveillance pillar.
- Developing novel means of communication

2



3



4

Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)

2018 Integrated Findings



CIPARS Canadian Integrated
Program for Antimicrobial
Resistance Surveillance
PICRA
Programme intégré
canadien de surveillance de
la résistance aux
antimicrobiens
Gouvernement
du Canada

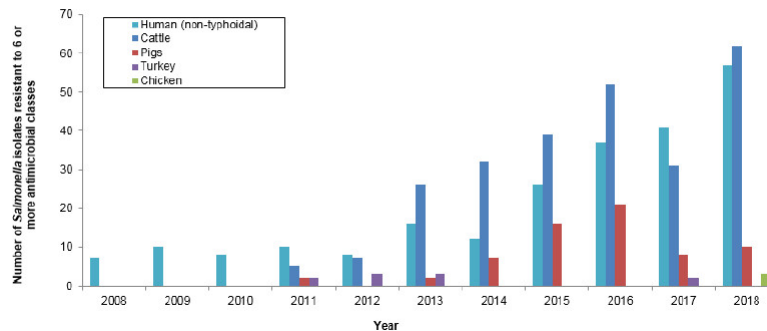
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5

Integrated AMR Data

HIGHLY DRUG-RESISTANT SALMONELLA

Number of *Salmonella* isolates resistant to 6 or more antimicrobial classes from 2008 to 2018.



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6

Integrated AMR Data

DETECTION OF QUINOLONE RESISTANCE IN *SALMONELLA* ENTERITIDIS FROM CHICKEN



In 2018, a clear **increase** in nalidixic acid (a quinolone) resistance among *S. Enteritidis* from chickens occurred across **several surveillance components from multiple provinces**.

RETAIL

1 isolate from a chicken burger in British Columbia (FoodNet Canada)



RETAIL

1 isolate from Alberta
Not previously observed



ABATTOIR

2 isolates from Ontario and Québec
Not previously observed



CLINICAL CASES

2 isolates from Ontario (sick chicken)
Previously observed in a single isolate in Manitoba (2010)



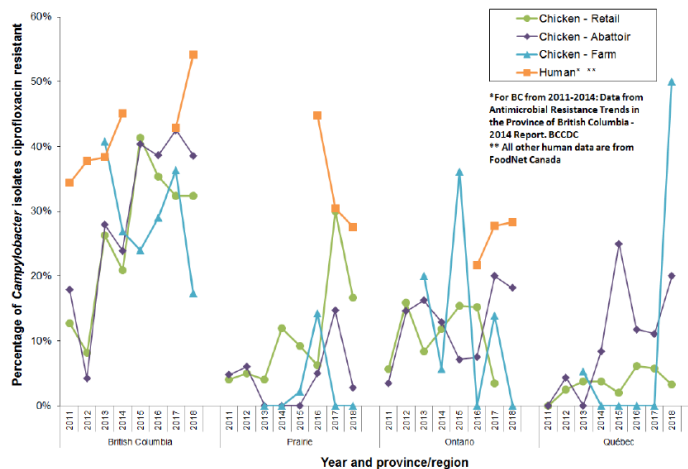
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7

Integrated AMU and AMR Data

FLUOROQUINOLONE-RESISTANT *CAMPYLOBACTER*

Ciprofloxacin resistance in *Campylobacter* isolates over time and between regions; CIPARS 2011 to 2018.



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8

Integrated AMU and AMR Data

CEFTRIAXONE RESISTANCE IN NON-TYPHOIDAL SALMONELLA

Reduction in reported use of ceftiofur on sentinel farms and changing resistance to ceftriaxone in non-typhoidal *Salmonella* from humans and chicken sources between 2013 and 2018.



The reduction in ceftiofur use and associated decrease in ceftriaxone resistance compared to pre-2014 data in chickens and humans is a good example of a successful intervention to limit antimicrobial resistance.

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9

Integrated AMU Data

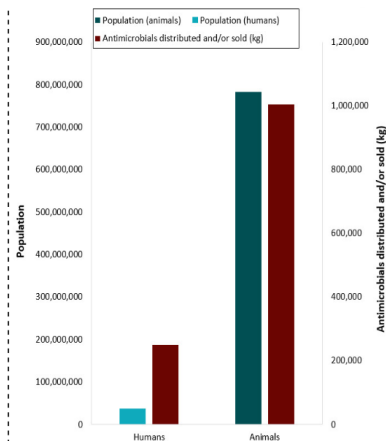
COMPARING HUMANS, ANIMALS, AND CROPS

5%

INCREASE IN TOTAL QUANTITY OF ANTIMICROBIALS (ADJUSTED BY BIOMASS) DISTRIBUTED FOR USE IN PRODUCTION ANIMALS SINCE 2017 AS A RESULT OF INCREASED TETRACYCLINE USE.

~1.4x

MORE ANTIMICROBIALS WERE DISTRIBUTED FOR USE IN ANIMALS THAN HUMANS AFTER ADJUSTING FOR UNDERLYING BIOMASS IN 2018.



21x

MORE ANIMALS THAN PEOPLE IN CANADA IN 2018.
Note: This is an underestimation, as fish are not included in the animal estimate.

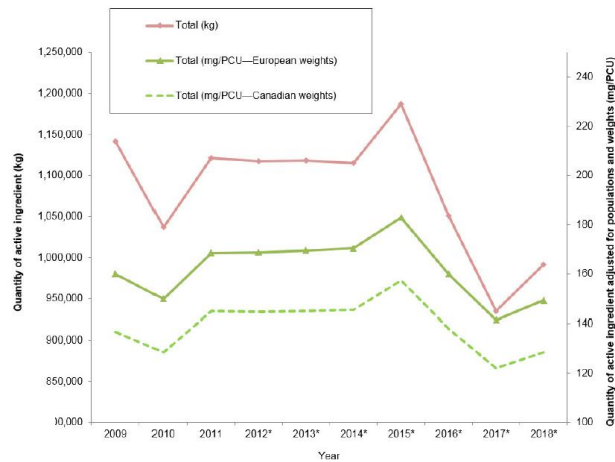
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10

Integrated AMU Data

The total quantities of antimicrobials distributed for sale for use in production animals **increased**. When measured in kilograms, the total quantities distributed increased by **6%** compared to 2017. When total quantities were adjusted for biomass (mg/PCU), the increase is **5%** compared to 2017.

Quantities of antimicrobials distributed for use in animals.

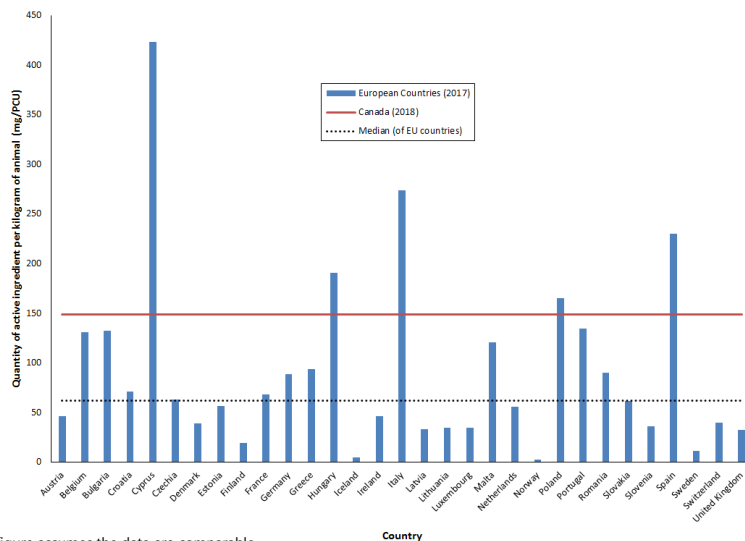


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11

Integrated AMU Data

Canada is the 6th highest country (in comparison to Europe) for quantities of antimicrobials sold (mg/PCU).



Note: This figure assumes the data are comparable.

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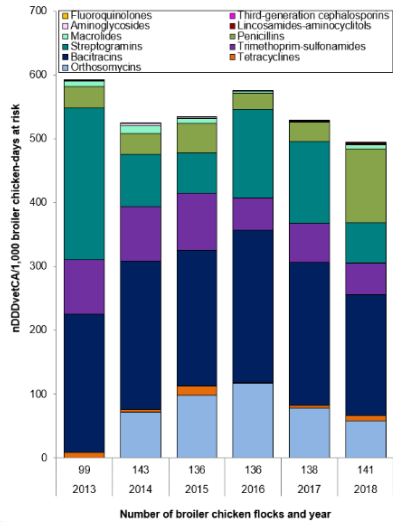
12

Integrated AMU Data

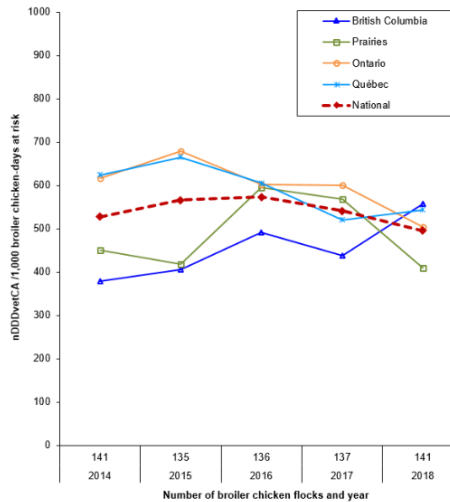


BROILER CHICKENS

Temporal trends in nDDvetCA/1000 chicken-days at risk, 2013 to 2018.



Temporal trends in nDDvetCA/1000 chicken-days at risk, by province/region, 2013 to 2018.



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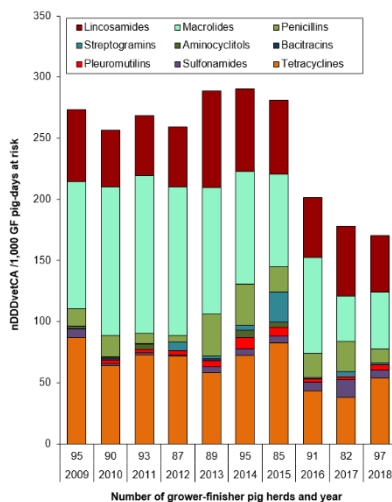
13

Integrated AMU Data

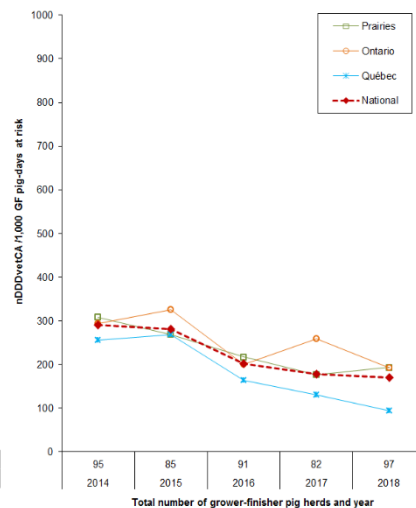


GROWER-FINISHER PIGS

Temporal trends in nDDvetCA/1000 GF pig-days at risk, 2009 to 2018.



Temporal trends in nDDvetCA/1000 GF pig-days at risk for antimicrobials administered in feed, 2014 to 2018.

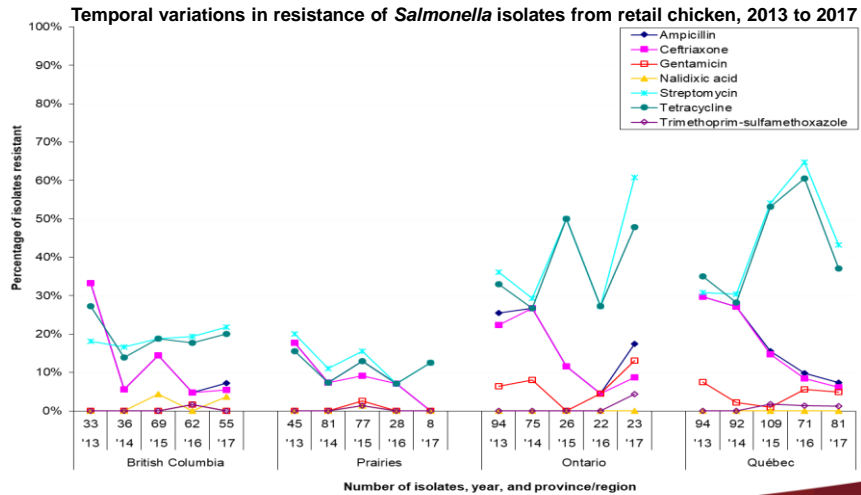


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14

Future Communication Products Examples

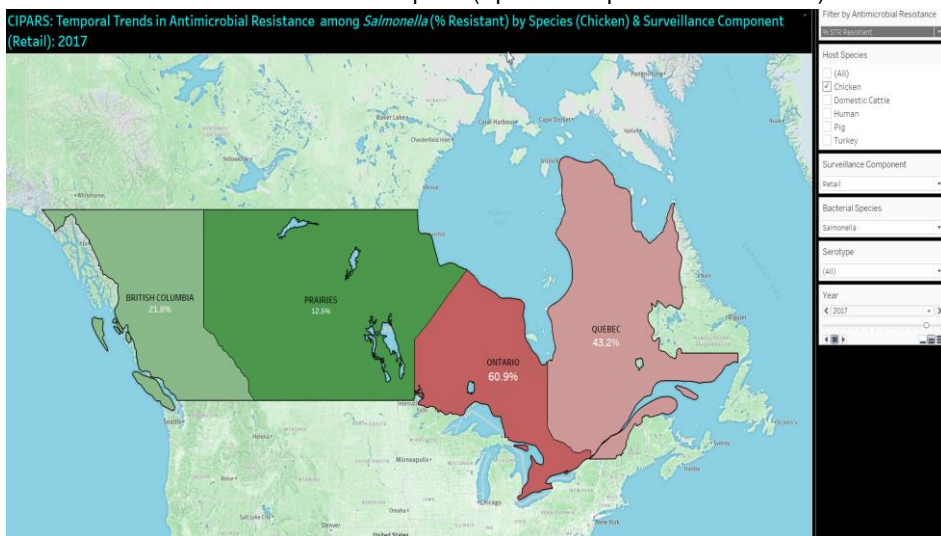
THE OLD WAY...



15

Future Communication Products Examples

Interactive Data Visualization – Example 1 (Spatial-Temporal Trends – AMR)



16

16

ACKNOWLEDGEMENTS

- Human (AMR)
 - Provincial Public Health Laboratories
 - FoodNet Canada (*Campylobacter*)
- Farm (AMR and AMU):
 - The veterinarians, producers and commodity groups who participate in the farm program, Saskatchewan Agriculture
 - Feedlot Cattle Surveillance: Canadian Agricultural Partnership in Alberta and Ontario, Alberta Cattle Feeders, Bayer, Beef Farmers of Ontario, McDonalds, Saskatchewan Agriculture, Saskatchewan Cattle Feeders and Vetoquinol
 - Dairy Cattle Surveillance: Funding provided by Dairy Farmers of Canada Dairy Research Cluster as part of the Canadian Agricultural Partnership
 - Fisheries and Oceans Canada (AMU)
- Abattoir:
 - The CFIA, abattoir operators, samplers and personnel
- Retail:
 - All the participating health units and institutions
- Clinical Animal Isolates:
 - Provincial Animal Health Laboratories
- Antimicrobial Use – distribution/sales in animals:
 - Canadian Animal Health Institute, Impact Vet
 - Health Canada's Veterinary Drugs Directorate
- Antimicrobial Use - distribution in humans:
 - Centre for Communicable Diseases and Infection Control
- Antimicrobials Sold as Pesticides for use in Crops
 - Health Canada's Pest Management Regulatory Agency