

strains of bacteria; concerns are typically focused around uses that are, or are perceived to be, inappropriate as these unnecessarily add to the burden of resistance. The use of these important drugs in food animals (e.g., chickens, pigs, cattle) may pose a risk to public health through potential transfer of antimicrobial resistant organisms or resistance genes in food.

The *Retail Meat Surveillance* component of CIPARS provides data on antimicrobial resistance among select bacteria found in raw meat at the provincial/regional level. Retail food represents a logical sampling point for surveillance of AMR because it is the endpoint of food animal production, and thus is indicative of human exposure. Retail surveillance provides a measure of human exposure to resistant bacteria through consumption of fresh, raw (uncooked) meat products from selected commodities.

Annual CIPARS reports are published on a regular basis. The objective of these reports is to provide a summary of the prevalence and trends (temporal variations) in antimicrobial resistance in select bacterial species isolated from humans and the agri-food sector. In the 2012 surveillance year, the [CIPARS Annual Report](#) was refined to include multiple chapters released in succession to make the CIPARS data available to stakeholders in a more timely fashion (1). This article summarizes some of the notable retail meat findings of the most recent 2012 CIPARS Report and links these data with findings from other CIPARS surveillance components.

Methods

The commodities of interest for retail meat surveillance reported here were raw meat products most commonly consumed by Canadians. These commodities and the products sampled by CIPARS included poultry (chicken legs or wings [skin-on]), pork (chops), and beef (ground). Turkey (ground) was also added in 2012 but with only one year of surveillance, data were not included in this summary. The unit of analysis was the bacterial isolate recovered from raw meat. Bacteria of interest in chicken were the pathogens *Campylobacter* and *Salmonella*, and generic *Escherichia coli* (*E. coli*), as an indicator of AMR selection pressure and a reservoir of resistance genes. From beef and pork, given the low prevalence of *Campylobacter* and *Salmonella* in these commodities at retail as determined in earlier years of the Program, only *E. coli* was routinely cultured and then tested for antimicrobial susceptibility. Retail meat samples are submitted from randomly selected geographic areas (i.e., census divisions defined by Statistics Canada), weighted by population, in each participating province/region. In 2012, retail meat samples were collected on a weekly basis in Ontario and Québec, and every other week in British Columbia, Saskatchewan, and the Maritime provinces (New Brunswick, Nova Scotia, and Prince Edward Island).

Prevalence estimates, based on an expected yield of 100 isolates of each targeted bacteria per commodity per province/region per year, are used to determine the number of samples to be collected. As sampling was less frequent in British Columbia, Saskatchewan, and the Maritimes, the target of 100 isolates per year was not always achieved in those provinces/regions in a given year.

Resistance is reported based on Health Canada's Categorization of antimicrobial drugs (2): Category I (very high importance to human medicine), Category II (high importance to human medicine), and Category III (moderate importance to human medicine). Retail data were analyzed and results compared and integrated with the other components of CIPARS (e.g., farm, abattoir, and human) to provide a more complete picture of antimicrobial resistance in food-borne bacteria in Canada. Full details about CIPARS including sampling, laboratory and analytical methods are available in the Annual Reports (3).

