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## May 30, 2020 Global Dog Populations

By Andrew Rowan, DPhil

In human health management, we generally must know the size of the problem before we can manage it successfully. This is also true of the management of animals such as dogs and cats. This letter will address what we know about the global dog population on the planet.

Ray Coppinger, a world authority on dog behavior, started my investigations into global dog numbers at least 25 years ago when he asked me a simple question: How many dogs are there? At the time, we estimated that there were at least 400 million dogs, but this number has turned out to be far too low. In 2013, Matthew Gompper at the University of Missouri estimated there were around one billion domestic dogs, and his publication started my investigation of the issue in earnest.

I now agree with Gompper that there may be close to one billion domestic dogs globally, but this does not tell us where or how those dogs live. I have become disenchanted with metrics that measure dogs per square kilometer or some other unit of area. Dogs are not spread out evenly across the landscape – far from it – and are mostly clustered around humans. Therefore, a measure that compares the number of dogs to the number of humans is, in my opinion, a far more relevant and valuable way to estimate dog numbers. For several years now I have been using the measure of dogs per 1,000 humans, and I can report that dog populations in different regions and countries vary from around 1-2 per 1,000 people (on the Arabian peninsula) to as

high as 800 per 1,000 humans (in rural communities in Chile).

This is a huge range, and we have very little insight into why dog numbers fluctuate so widely. It seems pretty obvious why there should be so few dogs in the Arabian Peninsula (Muslim attitudes to dogs tend to be negative), but why would Sweden have 80 dogs per 1,000 people compared to 140 in the UK and 240 in the USA? Or why would there be so few dogs in the New England states (around 110-140 per 1,000 people) and so many in some Rocky Mountain states (400 per 1,000 people in Montana)? These **discrepancies** are especially intriguing because these values have been stable for the past 30 to 40 years.

Fairly recently, a few colleagues and I began looking at the effect of human density on relative dog numbers. It has become evident that there is a strong inverse relationship between log human density and the relative number of dogs. A strong inverse density relationship has been found ( $R^2$  for the various trend lines ranges from 0.4 to 0.7). Such an inverse relationship has been documented for dog populations in US states, on the island of Mauritius, in the Indian state of Haryana, in Mumbai, in and around Rawalpindi in Pakistan and in Afghanistan's capital of Kabul, even though the relative number of dogs varies from 10 to 400 dogs per 1,000 people and the human density varies from a few people per square kilometer to over 40,000 per square kilometer.

The inverse correlation of relative dog numbers with log human density offers an opportunity to develop reasonably reliable predictive models for dog populations in different countries.

We also need to determine whether the dogs are pets, strays or feral animals. WellBeing International is now classifying dogs as either Private dogs (mostly pets), whose movements are subject to some control, or Street dogs, whose movements are not controlled.

There will be overlap between Private dogs that are allowed to roam for some part of the day and the Street dog population, but using this two-phase classification is a simple way to describe dog populations around the world.

Several authors (e.g. Coppinger) have argued that Street dogs vastly outnumber Private dogs, but WBI has found that this is not the case. Private dogs now outnumber street dogs (perhaps by a 3:2 margin) and there has been a steady global drift – though not necessarily purposely – towards moving dogs off the streets and into homes. For example, in the USA in the 1960s it was estimated that around 25% of all dogs were Street dogs, but today Street dogs are very rare and are mostly found in inner-city or rural communities. The level of control of dogs in the USA has increased substantially since the 1960s, measured as the proportion of Private dogs entering shelters annually (from around 30% in the early 1970s to 5% today).

Other important metrics to consider when looking at global dog populations are overall per capita income and the rural/urban divide. In most High-Income Countries (HIC), Private dogs constitute the vast majority of the population (90-95% or more). In contrast, in Low-Income Countries (LIC) and Lower Middle-Income Countries (LMIC) nearly all rural dogs are Street dogs. In LIC and LMIC, a percentage of dogs in urban cities (maybe 30-60%) will be Street dogs. Thus, one can begin to

draw a reasonably accurate picture of the global dog population by simply concentrating on country income levels and the proportion of the population classified as rural. Table 1 below provides estimated dog numbers for different regions of the world. The regional estimates have been derived from multiple surveys of both Private and Street dog populations. Note that Street dogs are in the majority where the rural proportion of the population is above 50%.

The regional dog estimates indicate that there are approximately 800 million dogs existing today, of which around 300 million are Street dogs. In other words, the majority of the dogs are Private dogs living as pets or guard dogs, and Street dogs compose only around 35-40% of the total – not 85% as some have claimed. Another common misconception is that Street dogs are all unowned strays. Some are certainly strays, but many are claimed to be “owned” by one household or another. Admittedly, these “owned” Street dogs are not treated in the same way as “owned” Private dogs, but they do receive some care.

Dog populations across the world are slowly shifting from the streets to the exercise of greater control by individual households. At the same time, the number of small animal veterinary clinics is exploding. For example, Malaysia’s first small animal clinic opened in 1980 but today there are around 500. In Jaipur, India, there were only a couple of small animal clinics at the turn of the century but today there are more than ten in the city. The number of small animal veterinary clinics is likely an indirect measure of the level of control of dog populations exercised by individual households. See also [Global Dog Campaign](#).