Dirty Money

The public health case for a cashless society

By Dina Fine Maron on January 3, 2017

Perhaps all money should be laundered.

Studies have piled up in recent years describing exactly how filthy—specifically how bacteria-laden—our dollars and cents can be. Fecal bacteria and other pathogens may have hitched a ride from someone’s hands, nose or apron onto our cash. And yeast or mold might have taken hold, too. The result could be a durable risk to our health whenever our money changes hands.

The fibrous surfaces of U.S. currency provide ample crevices for bacteria to make themselves at home. And the longer any of that money stays in circulation, the more opportunity it has to become contaminated. Lower-denomination bills are used more often, so studies suggest our ones, fives and tens are more likely to be teeming with disease-causing bacteria. Some of these pathogens are known to survive for months, according to a recent review of “dirty money” studies. Unfortunately, dirty dollars—whether denominations of $1 or $100—are not whisked away to the cleaners when they need it. They tend to circulate for about four to 15 years, according to the Federal Reserve. And U.S. coins last even longer: about 25 years, the Fed says.

While cash spends all that time wandering from, say, a cocaine-sniffer’s nose to a waiter’s hands to someone’s back pocket, it is going to meet microbes. Many may be harmless but others could make us sick, and data accruing since the 1970s spotlights the microbial milieu that can hide on our cash. Antibiotic-resistant bacteria such as methicillin-resistant Staphylococcus aureus (MRSA), which can cause life-threatening blood infections, can survive on our currency. The rogues’ gallery of pathogens isolated from banknotes or coins also includes: Escherichia coli (which can cause bloody diarrhea and sometimes even kidney failure or death) and Pseudonomnas aeruoginosa (which causes urinary tract and respiratory system infections). Separately, small quantities of cocaine, heroin, yeast and fungi have also been found on cash. A 2010 analysis by Australian researchers looked at the actual number of bacteria per square centimeter on various banknotes and found that a U.S. note contains 10 such microbes per square centimeter (higher than what Australia and New Zealand had on their currency.)

This pathogenic retinue likely extends beyond a few errant dollars that made their way to scientific labs. U.S. Air Force researchers published findings back in 2002 that concluded most $1 bills—94 percent of 68 tested dollar notes—were harboring bacteria, including some which could cause pneumonia or other serious infections.

That public health risk may bolster the argument for considering a cashless society, a perennial and controversial proposal that recently received a plug from economist Kenneth Rogoff in his new book, The Curse of Cash. For reasons that have more to do with reining in crime and promoting economic policy than public health, he recommends following the lead of countries such as Sweden that have already stopped allowing cash in many locations, requiring card-based payments instead.

Such proposals obviously raise serious considerations, including many people’s reluctance to have every financial transaction recorded. There are also the logistic challenges of phasing out cash—probably a heavy lift, considering that Americans have not yet scrapped the penny despite years of data showing that, economically, we should. But if the question of a cashless society is approached purely from a public health standpoint, the answer seems clear.

Money has a uniquely ubiquitous role in daily life. Although we often touch a variety of objects that could be capable of absorbing, harboring and transmitting infectious organisms, money is ever-present—and it is often close to food. “It is more probable to handle money and then food than to touch a subway pole or a commonly used doorknob and then food,” notes Manolis Angelakis, an infectious diseases researcher at Aix–Marseille University, who has studied dirty money. There is no definitive research that connects enough dots to prove dirty money actually makes people sick, but we do have strong circumstantial evidence: influenza, norovirus, rhinovirus and others have all been transmitted via hand-to-hand or surface-to-hand contact in studies, suggesting pathogens could readily travel a hand-money-hand route. In one study 10 subjects handled a coffee cup contaminated with rhinovirus—and half subsequently developed an infection.

The composition of our banknotes is especially concerning—more so than that of our copper-laden coinage, which appears to be less hospitable to bacteria. U.S. notes, made from a blend of 75 percent cotton and 25 percent linen, may be more attractive to bacteria than other countries’ currency. Polymer-based banknotes used in Australia and Canada have been found to be “cleaner,” meaning more resistant to dirt and bacteria, than cotton-based ones. There are no plans to change the composition of American money, however, the Federal Reserve wrote in an e-mail responding to queries. The Fed, which oversees the nation’s monetary policy and sets interest rates, said U.S. currency is not a very effective transmission agent for germs. It cited a 1982 study about lackluster survival of influenza viruses on environmental surfaces.

Yet subsequent work has found myriad microbes, including flu viruses, can persist on banknotes (depending on factors including humidity and moisture). Swiss researchers found in one 2008 study that flu viruses, which typically survive for a couple days on Swiss francs, can survive up to 17 days if accompanied by mucus—spelling trouble for folks who handle cash after someone else with a runny nose handled it. Still other studies of cash from around the world specifically point to high bacterial counts on money handled by food workers or on hospital grounds.

A recent snapshot of the U.S. money menagerie is also disquieting. In the last several years New York University graduate student Julia Maritz and her colleagues at N.Y.U.’s Center for Genomics and Systems Biology analyzed genetic material on 80 $1 bills and found roughly 3,000 types of organisms, including bacteria linked to pneumonia, food poisoning and staph infections. The ongoing research, still unpublished but covered by The Wall Street Journal, also highlighted the diverse kinds of exposure our money has to living things and geography: It found bills with traces of DNA from various animals—including white rhino. Still, “our research is focused on the presence of these [microscopic] organisms,” Maritz says. “We don’t work on the transmissibility aspects. We don’t know if these organisms are making people sick—it’s not something you can tell from the type of data we generate,” she adds.

Against this backdrop of critter-laden cash, doctors and researchers already recommend washing your hands before you eat. But what else can be done? Perhaps Rogoff’s cashless society proposal is not as far-fetched as it may seem. We would still touch other germy surfaces—including the keypads used in many cashless transactions—but every bit helps.

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