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ECB: End of Counterfeit Drugs

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TECHNOLOGY & SOLUTIONS

The sale of fake and substandard drugs is an international problem. The World Health Organization (WHO) reports that up to 10% of circulating drugs are counterfeits and the numbers for certain African countries are higher. "Especially in Africa, we know it's a very big problem," said Serge Rudaz, an associate professor at Geneva University's School of Pharmaceutical Sciences. "We know that people in the drug mafia are moving to the counterfeits."

The Institute of Medicine, an independent group that advises the U.S. federal government released a report on February 13th entitled Countering the Problem of Falsified and Substandard Drugs. The report notes the difficulty of identifying the counterfeit drugs. There is no real way to tell if the ingredients are bad or not. The report also identifies the additional problem that adulterated and thinned-down drugs can contribute to resistant germs and parasites. This has resulted in an outbreak of malaria and drug-resistant tuberculosis that can spread globally. "If you have a problem in Africa it does become a problem in the United States," says Dr. Otis Brawley of the American Cancer Society.

Contaminated, substandard and fake drugs have resulted in many horror stories in the past few years. Last fall, a Massachusetts pharmacy killed 45 people and sickened more than 600 with contaminated steroid injections. In 2009, 84 kids in Nigeria died from impure teething syrup. Moreover, it is near impossible to determine the full scope of the problem. As the Institute of Medicine's report stated, "Deaths from fake drugs go largely uncounted."

However, the Fribourg Institute, the Geneva University Hospitals, and the Geneva-Lausanne School of Pharmacy may have found an affordable solution to identifying counterfeit drugs. Together these organizations have created the Budget Capillary Electrophoresis (ECB) which can detect whether a drug is fake or real in only 20 minutes. To date, the ECB may be the easiest and most efficient way to detect and measure drugs, proteins, amino acids and organic compounds.

The ECB can detect complete counterfeits, drugs with less than the correct amount of active ingredients and medicines with impurities. These types add up to approximately 80% of the 200 core medicines that the World Health Organization (WHO) has identified. The solvents necessary to determine the quality of drugs are often difficult to obtain."In recent years, some solvents necessary for this analysis have gone off the market or have undergone major price increases, to the point of becoming unaffordable for health operators in developing countries," Serge Rudaz, an associate professor at Geneva University's School of Pharmaceutical Sciences, said. Thankfully, the ECB only requires a millionth of litre of solvent per analysis. The ECB costs 10,000, a tenth of the price of commercially available machines.

The cheaper than typical price combined with help from donors, enables Rudaz's organization to give away the ECB to areas having great difficulties identifying counterfeit drugs.

How does it work? The ECB detects drugs via the capillary electrophoresis technique. Technicians fill a tube with water and a small quantity of solvent, apply a high voltage, and watch the diluted drug pass under the ultraviolet rays. The speed of the diluted drug indicates its validity. "The ECB can't identify the medicinal composition – it verifies whether this duration corresponds to that of the original product. Each drug has its own charge and thus moves at a different speed," Rudaz explained.

Currently, 10 ECB machines have been produced. The first 3 are already being used in the national health laboratories of Bamako, Mali, and Dakar University, Senegal, and also by the health authorities in Phnom Penh, Cambodia. The remaining ECB machines will be sent to Burkina Faso, Madagascar, and Rwanda. More ECB machines will be built for Congo, Ghana, and the Ivory Coast. –

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Photo: Fast Company