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Rebecca Williams discusses the research, regulations and challenges of e-cigarettes

What effect, good or bad, do e-cigarettes have?

There is a lot of anecdotal evidence that e-cigarettes have helped people quit smoking, but there is not yet agreement in the Public Health community whether e-cigarettes should be promoted as a smoking cessation device and as a harm-reduction approach, or whether e-cigarettes are bad and should be avoided altogether. There is a mounting pile of research evidence showing that e-cigarettes have negative health consequences for their users, can be dangerous, and may, in some ways, be more dangerous than regular cigarettes. Some ingredients are "highly toxic" when vaporized and inhaled. These are ingredients typically used for flavor enhancing, but "safe to ingest" does not mean "safe to vaporize and inhale".

Further, e-cigarettes are getting kids to start using e-cigarettes who have never smoked: 40% of teen e-cigarette users never smoked cigarettes; 100% of teen e-cigarette users report having tried flavored e-cigarettes; 90% started with flavored e-cigarettes. There are more TEENS than adults using e-cigarettes today.

I think most public health researchers would agree that smokers are either going to keep smoking cigarettes, or they are going to switch to e-cigarettes, even though we don't know yet what the long-term health effects are. Most people would probably agree that (e-cigarettes) are less harmful than regular cigarettes; however, people that try to quit smoking with e-cigarettes are 38% less likely to quit successfully than people who do NOT use

e-cigarettes– they are more likely to become poly-users, using it as a bridge in between those times where they are not able/allowed to smoke cigarettes. Research has shown that the improvements in health biomarkers that occur when a person switches from combustible cigarettes to e-cigarettes go away if he or she smokes even one cigarette a day.

Switching from cigarettes to e-cigarettes is not equivalent to quitting smoking, after which the body begins to repair the damage done by smoking. It perpetuates a lifelong addiction to nicotine, with a product that has its own set of health consequences that are not yet fully understood.

Please tell us a little bit about your research and its relationship with public health and public health policy.

The research I do provides scientific evidence that state and federal lawmakers need to support legislation policies that will affect internet tobacco sales. We developed a regulatory framework, (or QUIT Framework: Quarantine of Unhealthy Internet Trade Framework). The government put our framework into use in 2005 with bans on using credit cards, PayPal®, or UPS® or FedEx® for online cigarette sales. Our subsequent research showed that while a lot of vendors stopped using credit cards and PayPal for processing, they just started taking e-checks instead, and switched to using the U.S. Postal Service, because it takes an act of Congress to change

postal service policy. That change thankfully came in 2009 with the PACT Act (Prevent All Cigarette Trafficking Act).

We then conducted research on the effects - or rather lack of effects - of the PACT Act. The bottom line is that internet tobacco vendors not only persisted in selling and shipping tobacco products to the U.S., as they did so, the customers who obtained products through these vendors became at high risk for credit card fraud.

However, e-cigarettes now are in a similar state as the early days of the cigarette sales industry.

The FDA announced in 2014 that they were going to assume jurisdiction over e-cigarettes and other tobacco products, and they had a long period of public commentary (followed by another period of review). My team submitted about 30 pages of commentary with data supported from our research about what regulations should be put into place - but it took a long period to see the first regulations announced. They started taking effect in August of 2016. More regulations are forthcoming, but may take a similarly lengthy period to put into place.

Are there any active campaigns to warn users?

While there are some health promotion campaigns out in the field warning people about the potential dangers of e-cigarettes, there is still much research to be done to fully understand whether they are an effective smoking cessation/harm reduction approach to cigarettes or a health hazard in their own right to be avoided by all. Thus, the public health community has been reluctant to put out a lot of public service announcements warning people to avoid e-cigarettes. The scientific community in general doesn't want to put out health warnings or regulations that are not supported by substantial research evidence. There is a lot of funded research underway about e-cigarettes. For example, some of my colleagues at UNC were testing (in the lab - in vitro = lung cell tissue; not

in humans) different flavors of e-liquids purchased locally to assess at what level of exposure each flavor causes lung-cell tissue death. They found that with both cinnamon flavors, or cinnamaldehyde (derived from natural cinnamon) and flavors with diacetyl in them (used to impart a, buttery or a creamy flavor) there is NO safe level of exposure: any exposure caused lung cell tissue death.

NIH research has shown that the time that it takes for information to get from research to broad dissemination (to where your doctor's office is giving you advice and asking about it) takes an average of 17 years for that information to go from research study to the doctor's office! I hope that with a rapidly emerging and progressing field like e-cigarettes and in the modern digital age, dissemination of research findings about e-cigarettes will take much less time.

What can partners, outside entities, and related organizations - say, an EHR vendor - do to better support the work you and your colleagues are doing?

I think adding a module similar to what's done to get doctors to ask their patients about quitting smoking - getting them to ask about e-cigarette use [similar to cigarette use (tobacco use)] to get them to ask about e-cigarette use. Giving them prompts for questions and prompts for information that they can give their patients about the relative lack of safety is something EHR companies can do to help promote getting doctors talking to their patients and having this conversation.



About Rebecca Williams, MHS, PhD

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Dr. Williams is a research associate at the UNC-Chapel Hill School of Medicine at the Lineberger Cancer Prevention and Control Center and Center for Health Promotion and Disease Prevention. She found her focus narrowing during her second year in graduate school at UNC as she began working with her mentor on the work he was doing in tobacco research. Beginning with research on internet tobacco sales in 1999, they have stayed with the market, expanding their focus along with the expansion of the industry into the promotion of e-cigarettes.