

Medical News & Perspectivesp205

The American Heart Association
Takes on Vaping

The JAMA Forump207

New Budgeting Tools Will Help Foster
Social Determinants of Health

Global Healthp209

Dengue Vaccine Protects Youth

Climate Change Puts Children at Risk

Cesarean Deliveries Not Linked to Obesity
in Latest Study

**News From the Food and Drug
Administration**p210

App Enables Sharing Off-label Treatments
for Infectious Diseases

New Test Detects MRSA in Hours
Rather Than Days

Duchenne Screening Test Is OK'd

Medical News & Perspectives

The American Heart Association Takes on Vaping

Jennifer Abbasi

About 28% of high schoolers and 11% of middle schoolers now use e-cigarettes, according to a recent *JAMA* study by researchers at the Centers for Disease Control and Prevention (CDC) and the US Food and Drug Administration (FDA). For most of the kids, controversy-prone JUUL was the e-cigarette brand of choice.

Altria—owner of tobacco giant Philip Morris USA—bought a 35% stake in JUUL in late 2018. For some, the move was a clear indication that e-cigarettes are less about quitting smoking and more about hooking a new generation of consumers on nicotine products.

At a recent American Heart Association (AHA) conference in Philadelphia, Rose Marie Robertson, MD, the group's deputy chief science and medical officer, spoke with

Audio

JAMA about e-cigarettes' health effects, the urgent need for more research, and initiatives to reduce youth vaping. The following is an edited version of the conversation.

JAMA: How prevalent is vaping these days?

DR ROBERTSON: The answer to that is completely different from what it would have been just a few years ago. In 2010, 2011, we were just beginning to see kids beginning to vape. We were just beginning to see e-cigarettes coming on the market. But by 2013, '14, '15, products like JUUL, which provide much higher levels of nicotine, were coming on the market. And they were heavily marketed.

Over the last several decades, we worked really hard to reduce the use of

combustible cigarettes, in youth particularly. And we had reduced that from perhaps 1 in 4 kids using combustible cigarettes to where we were down to 5% or 6%. So that was a great public health success. And it is being wiped away by the appearance of e-cigarettes.

Now, e-cigarettes, with all of this marketing and the spread through kids and social media, affect more than 1 in 4 kids, and it varies from community to community. There are millions of kids now using e-cigarettes. Some of them use it, try it a few times, and don't use it further. But some are using it every day, and those kids are becoming addicted. And they're beginning to notice that they're becoming addicted. In some cases, when we've done surveys through the

AHA's research program in tobacco, we find that they are desperate to quit vaping and just can't do it.

The CDC has called this an epidemic, and the CDC doesn't use that word lightly. It is a public health tragedy.

JAMA: Why is the AHA interested in e-cigarettes?

DR ROBERTSON: We've known for a long time that combustible cigarettes are bad for your health, and it's not just lung cancer and chronic obstructive pulmonary disease and other kinds of pulmonary problems. It is, in fact, heart disease as well—atherosclerosis, arrhythmias, sudden cardiac death, atrial fibrillation. Many cardiovascular problems are related to the



use of combustible cigarettes. We now have 3 Surgeon General's reports that make that case very clearly.

e-Cigarettes were advertised at the beginning as another way to quit smoking. We should've been more suspicious when they were advertised with flavors like bubblegum, and unicorn, and cotton candy. Those aren't the names you'd use if you were reaching for an adult audience. And you might not make them so easily hidden as they are in some of these products. They look like flash drives. They look like pens. They're hidden in what looks like the drawstrings of a hoodie. Kids are pretty good at hiding things anyway, and this makes it even easier.

[With] these later-generation e-cigarettes, 1 pod contains as much nicotine as a pack of cigarettes. And kids often will vape a pod a day, sometimes 2 or 3. Worse yet, that addiction often leads to a transition to combustible cigarettes. Other compounds are in e-cigarettes—heavy metals, propylene glycol, flavors, all sorts of things—and they're not regulated and approved by the FDA yet. Some of them have known toxic effects and others just haven't been studied yet.

JAMA: Are there potential cardiovascular effects from the nicotine in e-cigarettes?

DR ROBERTSON: Absolutely. [Products] like JUUL, which use nicotine salts rather than other forms that are present in previous e-cigarettes, are easier to inhale. They're not so irritating. And the [nicotine] level can be as high as inhaling a cigarette. So you get a very rapid rise, and then the level drops off quickly. You occupy those receptors, and then they get unoccupied. You're set up to become addicted.

We know that nicotine from cigarettes and from other forms affects blood pressure, heart rate, and myocardial contractility. And we know from hav-

ing studied some of the constituents of e-cigarettes that some flavors have effects on myocardial contractility or myocardial electrophysiology. Some have toxic effects on endothelial cells. Platelets are affected. So there's a whole host of things, and it depends on the flavor, and the concentration, and all those things.

We don't think that youth should be using these at all. We certainly don't think pregnant women should be using them, because we know that there are deleterious effects on the fetus. And we're concerned, in addition to those direct toxic effects, [about] addicting a new generation of young people.

JAMA: The AHA filed suit against the FDA—and won, correct?

DR ROBERTSON: We did. We and many others worked very hard to be sure that the FDA had the authority to regulate tobacco products. That was a great public health win, we think. Along with that authority came the ability to not just regulate conventional cigarettes, but to also deem other products regulatable, and that could include things like e-cigarettes, cigars, and cigarillos. We thought it was taking too long for those products to come under the authority of the FDA. So we pressed to make that happen faster. And fortunately, in the spring of 2020, that will happen. We're glad it will happen, and we think our public health colleagues at the FDA will be glad, as well.

JAMA: What are some of the initiatives the AHA is launching around e-cigarettes and vaping?

DR ROBERTSON: Having seen in the last 2 years in particular this explosive rise in teen vaping, we decided we have to be all in to try to thwart this epidemic. In terms of research, \$20 million [will be] devoted to a number of important areas. We have a lot of animal research data about the effects of nicotine on the early developing brain, on the

cardiovascular system. These kids are being exposed to very high levels of nicotine, and we don't actually have data about that. So we need more research in that area, for sure.

In addition, since some of these kids are becoming addicted, we need to know more about how to help them stop vaping, stop using nicotine products. We think that studies need to be done in those areas as well, and that that is really urgent. Some kids who are already smoking are using e-cigarettes as a cessation device, and we need to know if that's at all a reasonable thing to do.

And then, we need to be able to support research to know which policy initiatives will be most important. Across the country, literally hundreds of cities and some states have begun to think about banning flavored e-cigarettes. We know the flavors are very appealing to kids, and they help kids initiate the use. But we need to evaluate the impact of those policies.

In addition, we will have programs in schools. We had a meeting with school superintendents here about things that they're trying, some of which seem to be successful, some of which may not. But getting that information is going to be very helpful.

And then, kids want to fight back at this. This is a generation of kids that takes problems like this and says, "If 'Big Tobacco,' now masquerading as 'Big Vape,' is trying to addict us, and make us customers for life by addicting us, we're not going to let that happen. And we're going to tell them to stop lying about their product." Representatives of some of these companies—JUUL, for example—have gone to schools and said to kids, "This is a totally safe product." And that's just not true. Where it falls in the safety spectrum is a complex question, but even if it's safer, it's not safe. And it certainly isn't safe to be addicted. ■

Note: Source references are available through embedded hyperlinks in the article text online.