Less Healthy Food and Beverage Practices in Minnesota Schools 2002-2012

In US secondary schools, vending machines and school stores are a common source of snacks for students. Vending machines and school stores often sell foods that are low in nutrients, but high in energy density, including sugar-sweetened beverages, high-fat, salty snacks and candy. Consumption of these foods and beverages has been linked to health outcomes, including weight gain, and chronic diseases like obesity and diabetes.

In this presentation, we will discuss trends over time in the availability of vending machines and school stores, as well as the availability of low-nutrient, energy dense items, like sugar sweetened beverages, candy, and salty snacks. We will also discuss differences in vending practices among different types of schools: including Middle vs. high schools, alternative vs. regular high schools, and rural vs. urban and suburban schools. We’ll also look at differences in vending practices according to the percent of students who are eligible for FRPL, and the percent of minority students at each school. Finally, we will discuss trends in student sugary drink availability and consumption, including soda and sports drinks.

These tables show vending practices in high schools (represented by the solid line) and middle schools (represented by the dotted line) in MN from 2002 to 2010. We find that VMSS and SSB availability were more common in high schools than middle schools, except for 2002 (when SSB were available in essentially all VMSS in both middle and high schools) and in 2008 (when the proportion of schools reporting VMSS was similar across school type). There were some declines in VMSS and SSB availability in this 8 year study period, but between 2008 and 2010, high school availability of VMSS and SSB increased, whereas middle school practices continued to decline.

Here, we present vending practices for high fat salty snacks and candy in MN middle and high schools from 2002 to 2010. For both school types, salty snacks and candy
demonstrated steep declines in availability over the eight year period. Notably, salty snacks and candy were less common than SSBs. Between 2008 and 2010, the availability of salty snacks and candy in high schools increased while in middle schools the prevalence continued to decline.

Looking at trends over time in the 392 high schools in the sample, we find that between 2002 and 2008, we see substantial and significant decreasing trends in availability of VMSS and SSB, high-fat salty snacks, and candy. Yet, between 2008 and 2010, there was a significant change in the direction of the trend, from negative to positive, and there was an increase in vending machines and school stores and the availability of SSB in this period.

Within the 170 middle schools in the sample, we see significant decreasing trends in availability of VMSS and SSB, high-fat salty snacks, and candy. Unlike in high schools, these decreasing trends were sustained from 2002 all the way to 2010.

Next, we will consider differences in less healthy food and beverage availability in regular high schools versus alternative high schools. This table presents the characteristics of regular and alternative high schools in the sample. Compared with regular high schools, alternative high schools were more likely to be located in the city or in suburban areas. They were also more likely to have more than 40% of their students eligible for FRPL, and more likely to have a high minority enrollment.

These graphs show vending practices in regular high schools (represented by the solid line) and alternative high schools (represented by the dotted line). We see that the presence of vending machines and school stores is high for all schools, but there was some decline between 2002 and 2008. With the exception of 2004, VMSS were slightly lower in regular schools than in alternative schools. The availability of sugar-sweetened
beverages is also high in all schools, but appears to be slightly lower in 2008 than it was 2002 in regular schools only; in alternative high schools, there was no change between 2002 and 2008.

This graph presents the availability of high fat salty snacks and candy, respectively, in regular high schools (represented by the solid line) and alternative high schools (represented by the dotted line). Overall, the availability of high fat salty snacks decreased considerably in regular schools in the 6 year study period, from over 90% in 2002 to about 50% in 2008. The availability in high fat salty snacks in alternative schools declined too, but less – from about 95% in 2002 to about 75% in 2008. The availability of candy declined from 2002 to 2008 in all schools, while alternative schools had a higher availability of candy in 2002, about 100%. The availability of candy declined in these schools to just over 60% by 2008 – which is comparable to the prevalence in regular high schools.

Next, we will present differences in less healthy food availability by school location, FRPL eligibility, and % minority. We observed a number of differences in vending practices across school types, and these differences were most discernable by school location. In particular, across the years 2008 to 2012:

• We found that city schools were less likely (12.7% less likely) to have vending machine/ school store compared to town/rural schools.

• We also found that city schools were less likely (35.6% less likely) to have sports drinks available compared with town/rural schools.

So, these findings support the notion that town/rural schools may have more availability of some LNED items in schools than city schools.

We also found that suburban schools were less likely (8.4% less likely) to have sports drinks available than town/rural schools, but that they were more likely (13.9% more likely) to have soda available than town/rural schools.
We also saw no significant differences in availability by FRPL eligibility of the students, or by percent minority enrollment, although it is worth noting that, in MN, there is substantial overlap between school location and minority enrollment, so we are likely seeing an effect by location instead of by race/ethnicity.

When looking at differences in availability over time separated by school location, we see that, in 2008, city schools were much less likely to sell salty snacks than rural schools – less than 30% of city schools compared to about 60% of rural schools sell salty snacks. But by 2012, there is no longer a statistically significant difference between the groups, and we see that about 70% of schools surveyed sell salty snacks, whereas the number of rural and suburban schools selling salty snacks has not changed very much during the same period. We see some indication here that the city and rural disparity in the sale of salty snacks are no longer exists in 2012, even though the sale is still relatively high in all schools and has actually increased in city schools.

Finally, we will focus on differences in the availability of sugary drinks over time and the consumption of those drinks by students. This graph shows trends in vending sugary drinks from 2002 to 2010. In 2002, there was no difference between rural and non-rural schools in the vending of sugary drinks - about 90% of all schools had such drinks available. By 2008, we see large differences in the availability of sugary drinks, where sugary drinks are more likely to be available in rural schools; this difference continue to be present in 2010.

Here we see trends in the **consumption** of soda and sports drinks from 2001-2010 from the MSS. Consumption of soda declined slightly between 2001 and 2010, whereas consumption of sports drinks rose from 2001 to 2007, and appears to have leveled off since then. Reported consumption of water has risen slightly from 2001 to 2010. In 2010, students consumed on average 2.0 servings of soda and sports drinks per day, compared with 2.4 servings per day in 2001, which amounts to approximately 70
calories a day fewer in 2010 than 2001. There was no association between school policies relating to sugary drinks, and the consumption of soda and sports drinks.

In conclusion, we find that, despite the lower availability of LNED products in some school settings in recent years, less healthy food and beverages are still common and readily available in MN secondary schools. In particular, we find that it might be important to monitor trends in sports drink consumption over time. The 2004 Childhood Nutrition and WIC Reauthorization Act required all school districts participating in the federally-funded school meal program to develop and implement policies addressing nutrition guidelines for all foods and beverages by the 2006/2007 school year. Since the implementation of that policy, we find sustainable decline in some food practices, but not others.

We also find differential vending practices of LNED products in MN secondary schools. These differences favor certain types of schools, so that middle schools, non-alternative high schools, and urban/suburban schools are less likely to sell LNED items, compared with high schools, alternative high schools, and rural schools, respectively. It is also worth noting that we observed that policy trends are quite dynamic and may vary substantially over time, which indicates that continued surveillance is necessary.