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insights

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Seeds Of Knowledge.

Money Doesn't **Grow On Trees.**

JEFF RENOE ▪ **DICKSON INSIGHTS** EDITOR-IN-CHIEF

Vaccines do more than keep kids safe. They keep them in school. That may seem obvious, but it isn't something that's talked about enough. It needs to be; it's important.

Many school systems receive funding based on attendance. The more students who miss class, the less funding the school gets. Currently, we live in a time when the cost of educating our children has escalated in line with the increasing cost of technology. However, some estimates, like one made by US News in 2015, show that federal education funding has been reduced by 20% since 2011. These cuts mean schools literally cannot afford to have students miss school. Vaccinations can help.

In the pages that follow you'll learn more about child vaccination rates, the Vaccine for Children program, and how both are related to the quality of education your local schools may be delivering.

Thanks for reading, and I hope you enjoy the August issue of **Dickson Insights.**

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CYBER RANSOM

Is Hospital Data In Jeopardy?

Cyber ransoms are a real thing, and one may soon be affecting a hospital near you if it hasn't happened already.

Last month, Methodist Hospital in western Kentucky was operating "in an internal state of emergency" because a part of its computer network had been rendered useless. It all happened thanks to something called ransomware, a type of computer virus that encrypts computer files. It wasn't the first hospital to be hit in such a way, and it probably won't be the last.

"[Hospitals] have critical information and money to pay," said Ed Cabrera, an executive at cybersecurity firm, Trend Micro. "They're seen as easy targets."

Cabrera's firm actually predicted such ransoms would become an ongoing issue when they pronounced that "2016 will be the year of online extortion." Below is an excerpt from their proclamation.

In the past decade, cyber extortionists made use of ransomware to trick online users to make them fall for their tactics. This was done by exploiting one's fears to coerce victims into paying the ransom. The rogue/fake AV trap was set up to target those who feared computer infection. Earlier variants of ransomware locked screens of users, tricking them into paying to regain access. Police Trojans threatened users with arrests and charges for violations. And finally, with crypto-ransomware, cybercriminals aimed for the most valuable part of one's system, the data.

Methodist has said via prepared statement that "no patient data or records were compromised," in the attack; however, they have not clarified what documents were affected.

The attack occurred through email when a message containing the ransomware was opened by an employee. This allowed the infection to spread into the network where hackers were able to hold data hostage. They then required Bitcoin, an electronic money that's difficult to trace, in exchange for the release of the network.

The total ransom was not released by the hospital, but experts estimated the demand at four bitcoins. Based on today's exchange rate, that would equate to just over $1,600. To date, that's

fit with the typical modus operandi of hackers, who target based on volume. By keeping their demands low, typically in the neighborhood of $300, those affected are willing to just pay the ransom to regain access to their files. Rather than deal with the hassle fighting the issue or risk a drawn out affair, some victims just pay to get their files back.

Methodist Hospital was not one of those victims. Thanks to backup files, the hospital was able to shut down infected parts of their system and rely on the information they stored elsewhere. As mentioned above, the Kentucky hospital wasn't the first to be attacked and it won't be the last. The most notable to date was the Hollywood Presbyterian Medical Center that paid $17,000 in bitcoins to get its computer back up and running. Both are working with law enforcement to find solutions to the crimes.

With data suggesting hackers are looking for small scores across mass victims, it's safe to assume these crimes will only continue to happen in the future.

D

The Future Is Now:
Thought Controlled Wheelchairs

Psychic powers may not be real, but a team at Duke University has developed technology that would seem to manufacture the abilities in those who suffer from paralyzation.

Through their experiments, they've shown that monkeys now have the ability to control the motion of a special wheelchair using nothing but their thoughts. Based on a study that suggests 70 percent of disabled patients would accept surgical implants for the opportunity to walk again, the team of scientists has been working on wireless implants that could provide such opportunities.

During research, the team implanted microfilaments directly into the brains of two rhesus macaque monkeys. Researchers measured the activity of nearly 300 neurons in each of the subjects. During measurement, the monkeys were placed in specially developed wheelchairs at numerous points throughout a room. Using nothing but their thoughts, both monkeys then used the wheelchairs to navigate across the room for food.

For a video of the wheelchair in action visit http://blog.dicksondata. com/2016/04/giving-hope/

These wireless implants would be a remarkable change from current, similar technology that requires wires. Most rely on EEG and a wired model along with some physical capability in the user. Unfortunately, some physical capability is impossible in many patients--like those who suffer from quadriplegia or ALS--making this new wireless option a valid one for more patients in need.

This isn't the first time that such mental technology has been worked on either, and it may be relatively 'simpler' to create than you might think. A Brooklyn-based company called OpenBCI has developed a headset that can be created via 3D-printing. For only $450 you can get your hands on such a device that records brain waves and converts them into signals that can control everything from a robot arm to a remote-controlled helicopter.

Such companies provide hope that this kind of technology may be closer at hand than many realize and at a price point that isn't as far out of reach as one may expect. Based on a 2009 study by the Christopher and Dana Reeve Foundation, it's estimated that 5.6 million Americans are paralyzed, representing nearly 2 percent of the population. This new technology could help provide new opportunities to many of them.

If these new ways of thinking could potentially provide hope to the most cherished of your assets, those you love, then it will have done considerable good for the long term health of society.

D

DicksonOne

Wireless Temperature and Humidity Monitoring

HOW IT **WORKS**

When you log onto **DicksonOne.com**, your environmental data, from every location, appears before your eyes. Charts and pens, get outta here. USB cords and software on a disc, you too. **DicksonOne** Loggers transmit your data wirelessly to the **DicksonOne** Cloud, where you can access it anytime.

Power Over Your Environment

EMAIL, TEXT & PHONE CALL ALARMS

When something bad happens in your facility, **DicksonOne** can send anyone in your organization an email, text, or phone call. Temperature too high? Humidity too low? We've got you covered.

CUSTOMIZABLE REPORTS

The DicksonOne Reporting Suite allows you to:

- Create and customize reports for any and all of your loggers
- Choose who in your organization will receive which reports
- Change and modify the frequency of reports
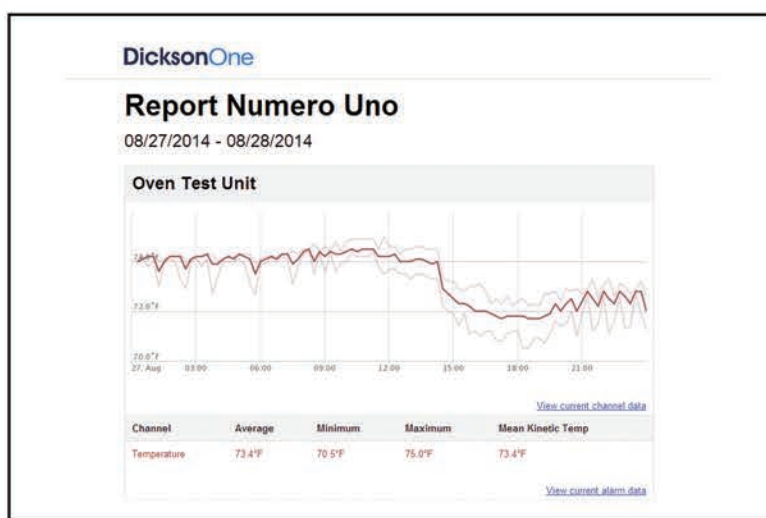
TEMPERATURE MAPPING SERVICES

KEEPING YOUR PRODUCTS SAFE

HOW IT **WORKS:**

1 CALL US: 630.543.3747   **2** WE MAP TO YOUR NEEDS   **3** WE PROVIDE DIRECTION

WHAT **YOU GET:**

- Testing or Validation Plans
- Problem Spot Analysis
- Refrigerator, Freezer, Incubator and Warehouse Mapping
- Acceptance Criteria Creation
- Temperature Recovery Studies
- Temperature and Humidity Monitoring Consultation
- Testing Summary Report

WHAT **WE OFFER:**

- 90 Years of Temperature Mapping Experience
- A team of expert Consultants, Engineers, and Mapping Technicians
- High Accuracy, High Reliability Data Loggers
- A2LA Calibrated Temperature Recorders
- Secure Data Recovery, Analysis and Distribution
- Analysis Performed with 21CFR Part II Compliant Software

Connect With Us:

7

Meet The New
DicksonOne Logger

THE BEST JUST GOT BETTER

Larger, More Detailed Display ▪ Compatible with New Universal Replaceable Sensors

Over the Air Updates ▪ Smaller Footprint

Updated Design

DicksonOne **Touchscreen Loggers**

Our goal when designing the new line of **Touchscreen Data Loggers** was to create a feature-heavy and easy-to-use device that allowed users access to their entire data history, anywhere. We pushed the limits of connectivity, user-interface, and functionality, to deliver the most robust data logger on the market.

Data At The Source

1 The Graph Your environmental history just got a whole lot easier to navigate through. We overhauled the user-interface, and made it easy to view and manage your data.

2 Your Channels Every touchscreen will automatically calculate the minimum, maximum, and average temperatures of your selected view.

3 Real-time Monitoring Push the play button, and your device will update back to the most recent set of readings.

4 Device Settings Your Touchscreen is robust. When you navigate your devices settings, you can adjust sample rates, set alarms, and connect to DicksonOne.
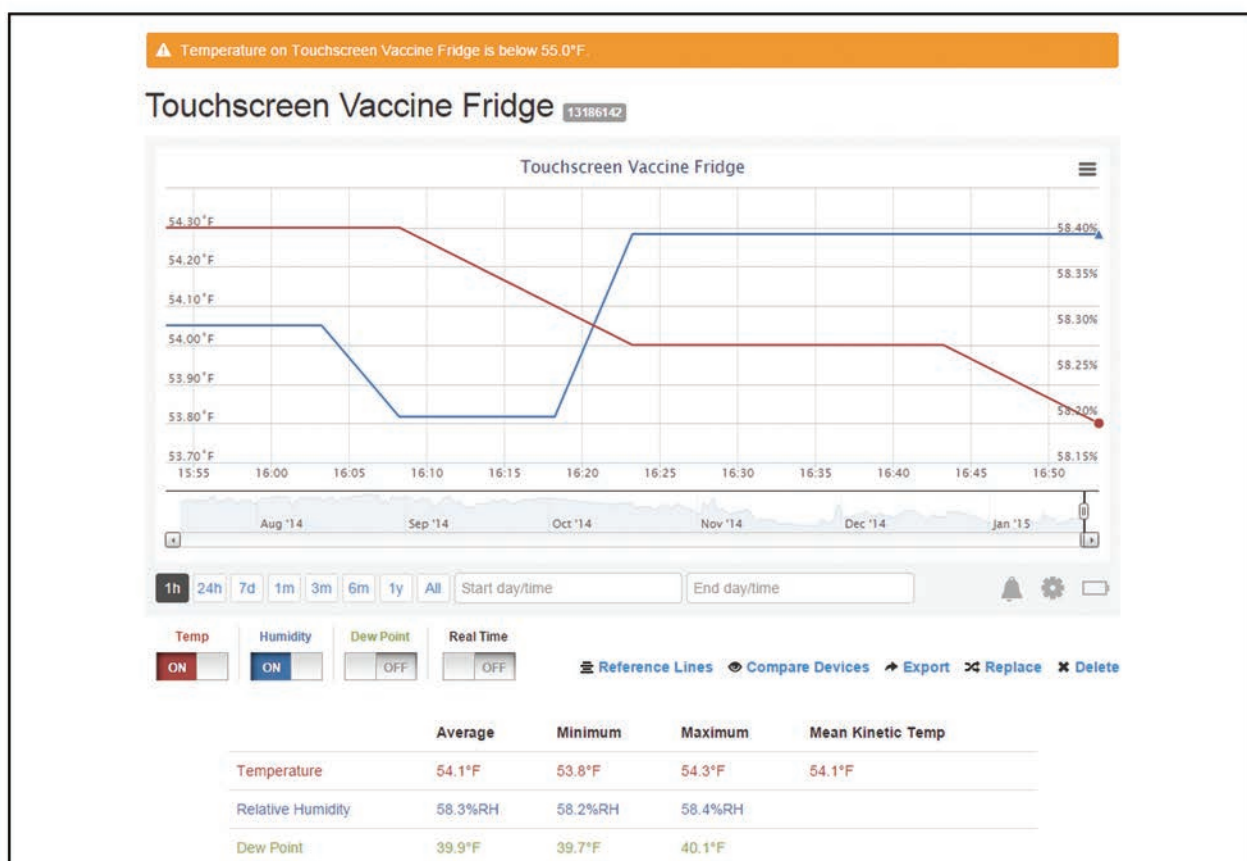
NOW WITH DicksonOne

The **Touchscreen** now gives you the option to connect directly to **DicksonOne.** You get all of your data at your fingertips, and now you can access it anywhere too. Just connect your device to your local WiFi network or plug it into an Ethernet port, log into **DicksonOne**, and boom, complete data control.
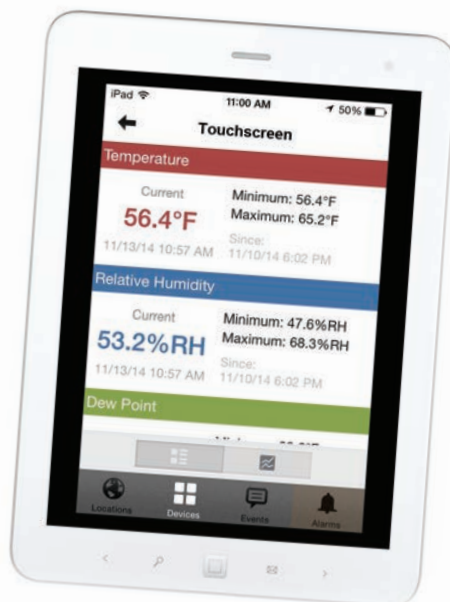
DicksonOne Allows You To:

- Get email, text, or phone call alarms from your Touchscreens.

- Access every one of your Touchscreens' data history on one website.

- Generate customizable reports, delivered directly to your inbox when you want.

The new Touchscreen allows for USB download to DicksonWare.

Only DicksonWare A017/A027 will function with Touchscreen Loggers.

DicksonOne
Touchscreen Pricing

MODEL	REMOTE PROBE	PRICE
TSB	USB Download	**$424**
TWE	DicksonOne WiFi/Ethernet Connection and Download	**$524**
TWP	DicksonOne Download and Power over Ethernet	**$599**

The TSB, TWE, and TWP all allow for basic USB download independent of DicksonOne. Use DicksonWare A017/A027 for USB download with these models.

DicksonOne
Display Logger Pricing

MODEL	REMOTE PROBE	PRICE
DWE	DicksonOne WiFi / Ethernet Connection and Download	**Starting at $350**

DicksonOne
Software Pricing

DEVICES	FEATURES	PRICE
1 to 10	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms	**$300/year**
11 to 25	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms	**$725/year**
26 to 50	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms	**$1400/year**
51 +	Unlimited Data, Multiple Sample Rates, API Access, Email, Phone, and Text Alarms	**Call for Quote**

*   Dickson offers a Basic Plan with a rolling window of 30 Days of data. One hour sample rates for unlimited loggers at no cost.

Calibration In Five Seconds

HOW REPLACEABLE SENSORS **WORK**

Dickson Replaceable Sensors are Dickson's answer to the headache of calibrating your temperature or humidity monitoring device. When your device needs to be calibrated, just pop off your sensor and pop on a new one. It's that easy. Now when you order a DicksonOne or Touchscreen Logger, you get the benefit of never having to ship a logger back to us again.

WITHOUT REPLACEABLE SENSORS

1. Order a recalibration for your device
2. Acquire a Return Authorization Code from a Dickson Representative
3. Take unit out of its environment
4. Move products out of environment/install backup monitoring system
5. Box unit up
6. Ship unit to Dickson
7. Dickson recalibrates unit and ships it back
8. Receive the unit
9. Disassemble backup system/move product back into environment
10. Reinstall unit/system

Total Down Time: 7-10 Days

VS

WITH REPLACEABLE SENSORS

1. Order a Replaceable Sensor
2. Take old sensor off, put new sensor on

Total Down Time: 0 Days

All DicksonOne and Touchscreen Loggers are
RS COMPATIBLE.

High Temp Solutions

1 **HT 300 Waterproof, High Temperature Data Logger** HACCP and FDA Compliant. USB Download. IP68 Rating. Temperature Range -40° to 257°F (-40° to 125°C). **$349**

2 **HT350 High Temperature Process Logger** HACCP Compliant, K-Thermocouple Probe, USB Download, and a large temperature range. Temperature Range -40° to 257°F (-40° to 125°C). **$349**

D605 Probe sold separately. For more information on Dickson's Probes and Accessories, visit **dicksondata.com.**

Instant Data Solutions

3 **TC700/TH700 Touchscreen Handheld Indicator** Instant temperature or temperature/humidity data. No-slip silicone cover. Battery powered. **$299**
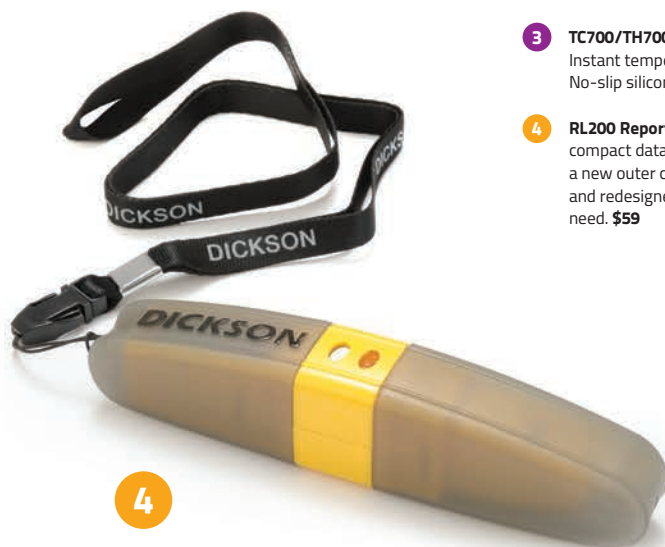
4 **RL200 Report Logger** We decided to make the best compact data logger on the market, our RL200. With a new outer case, user selectable logging times, and redesigned PC interface, it's exactly what you need. **$59**

Connect With Us:

Temperature and Temperature/Humidity
Chart Recorders

Want a physical readout right where you are monitoring? Our Chart Recorders have you covered. For ninety years we've built the best chart recorders in the business. Check out our models below.

8 and 6 Inch Models

Eight and Six Inch Chart Recorders display detailed temperature and humidity values.

MODELS AND FEATURES

KT6P	6 Inch Temperature	**Starting at $369**
KT8P	8 Inch Temperature	**Starting at $419**
TH6P	6 Inch Temperature and Humidity	**Starting at $489**
TH8P	8 Inch Temperature and Humidity	**Starting at $489**

4 and 3 Inch Models

Four and Three Inch Temperature Chart Recorders designed to fit any application.

MODELS AND FEATURES

SL4350	4 Inch	**$239**
SL4100	4 Inch	**$239**
SC3 Series	3 Inch	**$239**

Charts sold separately. For charts and accessories, call **630.543.3747** or go to **www.DicksonData.com.**

PRESSURE DATA LOGGERS

Pressure Data Logger One second sampling rate. User replaceable battery. Optional delayed start. USB connectivity. Pressure sensor includes built-in diaphragm seal.

PR125	**$499**	0-100 PSI
PR325	**$499**	0-300 PSI
PR525	**$599**	0-500 PSI

Rugged Utility Pressure Data Logger Water resistant case. 3 year battery. Unobtrusive design. Fits easily in a toolbox. USB Connection.

PR150	**$499**	0-100 PSI
PR350	**$499**	0-300 PSI

PRESSURE CHART RECORDERS

4 and 8 Inch Models

Four and Eight Inch Chart Recorders to meet your needs.

Single AA battery powered. Rugged low-maintenance design features. 7-day or 24-hour recording times. 1/4 inch NPT Connector.

MODELS AND FEATURES

0-100 PSI	**PW860/1**	$629	PW470	$449
0-200 PSI	**PW864/5**	$629	PW474	$449
0-300 PSI	**PW866/7**	$629	PW476	$449
0-500 PSI			PW479	$449
0-1000 PSI	**PW875**	$749		

Charts sold separately. For charts and accessories, call **630.543.3747** or go to **www.DicksonData.com.**

Connect With Us:

MAPPING DATA LOGGERS

SP125 $119 Temperature Logger. Accuracy ±1.2°F, ±0.67°C. Range -10 to 176°F, -23 to 80°C.
SP175 $229 Temperature Logger with Thermocouple Probe. Accuracy ±1.8°F, ±0.1°C. Range -300 to 2000°F, -30 to 50°C. A203 Probe required for +500°F.
TP125 $199 Temperature and Humidity Logger. Accuracy ±0.8°F, ±0.45°C. Range -10 to 176°F, -23 to 80°C.

SK550 $699 Temperature. Pack of twelve. Accuracy ±1.8°F, ±1°C. Range -4 to 158°F, -20 to 70°C.
TK550 $999 Temperature & Humidity. Pack of twelve. Accuracy ±1.8°F, ±1°C. Ranges -4 to +158°F, -20 to +70°C.

DISPLAY DATA LOGGERS

SM300 $249 Temperature Logger. Range -4 to 158°F, -20 to 70°C. Accuracy ±0.8°F, ±0.44°C.
SM320* $299 Temperature Logger. Remote Probe. Range with Probe -300 to 2000°F, -184 to 1093°C. Accuracy ±1.8°F, ±1.0°C.
SM325* $399 Temperature Logger. Two Remote Probes. Range with Probe -300 to 2000°F, -184 to 1093°C. Accuracy ±1.8°F, ±1.0°C.
SM420 $499 Temperature Logger. Remote Probe. Range with Probe -50 to 350°F, -45 to 176°C. Accuracy ±0.5°F, ±0.28°C.
TM320 $299 Temperature and Humidity Logger. Range -4 to 158°F, -20 to 70°C. Accuracy ±0.8°F.
TM325 $399 Temperature and Humidity Logger. Remote Probe. Range -40 to 185°F, -40 to 85°C. Accuracy ±0.8°F.

SP425 $159 Temperature Logger. Digital Display. Accuracy ±1.2°F, ±0.67°C. Range -4 to 158°F, -20 to 70°C.
TP425 $249 Temperature and Humidity Logger. Digital Display. Accuracy ±0.8°F, ±0.45°C. Range -4 to 158°F, -20 to 70°C.

Vaccine programs do more than keep us safe from illness. They provide important, and often necessary, protection against illnesses that have proven over time to be fatal. It's why manufacturers and medical providers are being required to...

Ante Up!
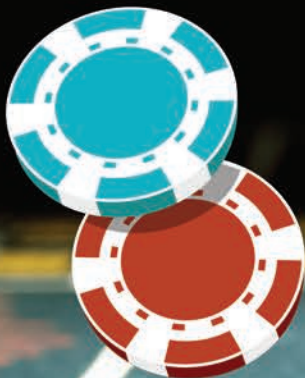
Diseases and illness have plagued our world since the beginning of time. In the 1300s, the world faced the Black Death. In the 19th century tuberculosis was dubbed the White Plague. The early 20th century brought Polio. Today, each of these diseases have been dramatically reduced, if not eliminated, worldwide thanks to a variety of vaccines that have been developed and introduced into society.

Conversations about the potential side effects that a vaccine may, or may not, offer to patients aside, they've helped Americans and members of the world's population live longer, healthier lives. Below is a timeline that shows the growing life expectancy rate in the United States, compared to key vaccine development dates over the last 80 years.

While there have been additional factors involved with extending American's lives, like diet and disease treatment, according to UNICEF, (United Nations Children's Fund), more than nine million deaths are prevented annually thanks to these vaccines. In fact, the World Health Organization estimates that 43 million lives have been saved since 2000 thanks to advancements in Tuberculosis care alone.

It's for these reasons that vaccine requirements exist and why initiatives like the Vaccines for Children (VFC) program are in place. Below is the purpose of VFC as defined by the Center for Disease Control.

The VFC program is a federally funded program that provides vaccines at no cost to children who might not otherwise be vaccinated because of inability to pay. CDC buys vaccines at a discount and distributes them to grantees—i.e., state health departments and certain local and territorial public health agencies—which in turn distribute them at no charge to those private physicians' offices and public health clinics registered as VFC providers. Children who are eligible* for VFC vaccines are entitled to receive those vaccines recommended by the Advisory Committee on Immunization Practices. These vaccines protect babies, young children, and adolescents from 16 diseases.

You can learn more about those 16 diseases on the CDC's website at: http://www.cdc.gov/vaccines/parents/diseases/index.html

The program was established in 1994 and it has been estimated that the VFC has saved two of the country's greatest assets: Children and money.

CDC estimates that vaccination of children born between 1994 and 2013 will:

prevent **322 million** illnesses → more than the current population of the entire U.S.A.

help avoid **732,000** deaths → greater than the population of Boston, MA

save avoid **$1.4 trillion** in total societal costs → or $4,473 for each American

Not only has the program saved lives and reduced costs, it can also be theorized the program has helped our public school systems. As students start heading back to school, consider this: it's estimated that 164 million school days are lost each year because of student illness. That's an average of 4.5 days per child. While keeping our students inside our schools so they can learn is important, the real value may be in the dollars and cents.

GROWTH OF US LIFE EXPECTANCY

1921: Tuberculosis Vaccine Introduced

1947: "Massive" Smallpox Vaccination Effort

1955: Polio Vaccine Introduced

1981: Hepatitis B Vaccine Approved

1996: DTaP Vaccine Approved

— **All Americans**
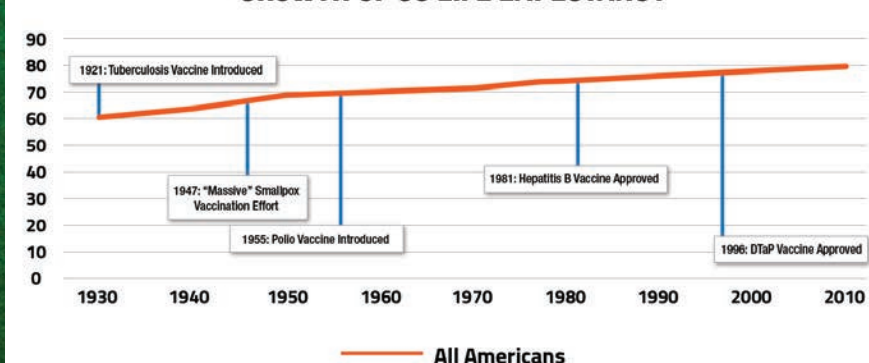
In several states in the U.S., absenteeism is factored into the formula that determines a school's funding. For example, It's been estimated that public schools in San Diego County in California lost out on $624 million between 2006 and 2010. Were it not for programs like VFC, more days would be missed in low income, unvaccinated areas and more money would be lost to children in those schools. This is doubly important when you consider that nearly half of a school district's funding comes from the state so missing out on this major source of income has a huge impact.

According to the Center for Public Education most districts across the country have been forced to make drastic cuts because of ongoing budget shortfalls. This has affected many systems differently, however one such example was recently made public by Muncie Community Schools in Indiana. On April 26th, the Superintendent of Schools announced that his school system is projected to have a budget deficit of nearly $38 million by 2019 without immediate action to reduce expenditures.

While the school hadn't yet decided how to eliminate its shortfall, the Center for Public Education has looked at some of the most common cuts that schools across the country have had to make over recent years. The list is as follows:

- Laying off teachers
- Cutting extracurricular activities
- Cutting courses not required for graduation
- Eliminating summer school
- Adopting a four-day school week
- Eliminating field trips
- Cutting instructional programs
- Cutting professional development for teachers and staff.

The local school system in Muncie isn't the first to face major budget crunches and, with the way funding has gone, it certainly won't be the last. According to the Center on Budget and Policy Priorities, at least 31 states provided less funding per student in 2014, than in 2008. To the right is a chart that illustrates the changes that have occurred by state since '08.
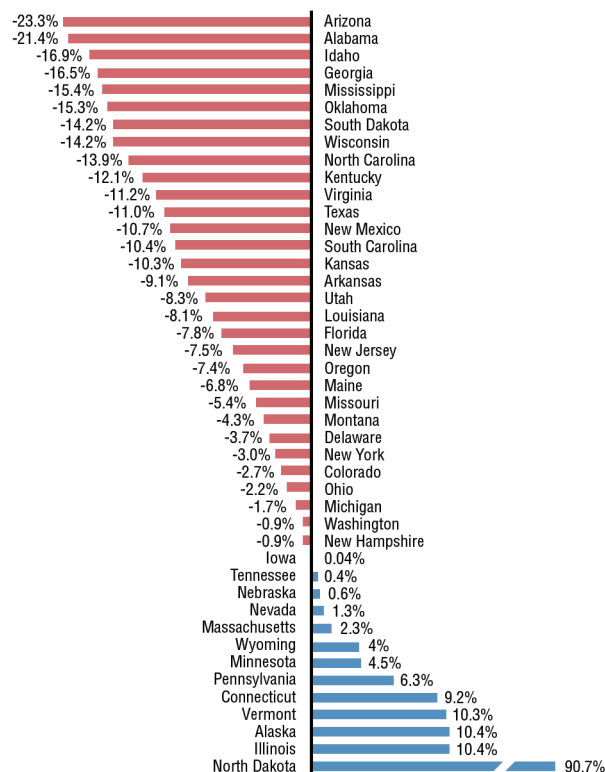
Law Street Media, a publication that is written by and for millennials, explored the effects these kinds of cuts can have on students. According to their research the cut of programs due to budget shortfalls, fine arts programs specifically, has shown to have a direct impact to a student's performance in class and their likelihood of reaching graduation. Here is an excerpt from their published report.

Students who took four years of art classes scored 91 points higher on their SAT exams than those who took half a year or less. Multiple studies also confirmed that there is a correlation between art engagement and students' other achievements. Students who regularly participated in art classes were four times more likely to be recognized for their achievements.

It may not surprise you based on those numbers, but art programs can also have a direct impact on a school's graduation rates. In fact, the Center for Arts Education noted in a 2009 report that schools with solid art programs had higher graduation rates than those that didn't.

TOTAL STATE K-12 FUNDING BELOW 2008 LEVELS IN MOST STATES

Percent change in total state funding per student, inflation-adjusted, fiscal years 2008-2014

State	Percent change
Arizona	-23.3%
Alabama	-21.4%
Idaho	-16.9%
Georgia	-16.5%
Mississippi	-15.4%
Oklahoma	-15.3%
South Dakota	-14.2%
Wisconsin	-14.2%
North Carolina	-13.9%
Kentucky	-12.1%
Virginia	-11.2%
Texas	-11.0%
New Mexico	-10.7%
South Carolina	-10.4%
Kansas	-10.3%
Arkansas	-9.1%
Utah	-8.3%
Louisiana	-8.1%
Florida	-7.8%
New Jersey	-7.5%
Oregon	-7.4%
Maine	-6.8%
Missouri	-5.4%
Montana	-4.3%
Delaware	-3.7%
New York	-3.0%
Colorado	-2.7%
Ohio	-2.2%
Michigan	-1.7%
Washington	-0.9%
New Hampshire	-0.9%
Iowa	0.04%
Tennessee	0.4%
Nebraska	0.6%
Nevada	1.3%
Massachusetts	2.3%
Wyoming	4%
Minnesota	4.5%
Pennsylvania	6.3%
Connecticut	9.2%
Vermont	10.3%
Alaska	10.4%
Illinois	10.4%
North Dakota	90.7%

Note: California, Hawaii, Indiana, Maryland, Rhode Island, and West Virginia are excluded because the data necessary to make a valid comparison are not available. Source: CBPP budget analysis and National Center for Education Statistics enrollment estimates.

Programs like VFC may have made it more difficult to keep auditors happy, but at the end of the day asset protection is the single most important thing on all of our minds. When we're talking about vaccinating children and keeping them safe, we have a chance to look at the bigger picture of how our assets affect those that are most important. At the end of the day, if we ante up it's society that gets to cash out.

For a list of sources used in this story search VFC at blog.dicksondata.com

Replaceable Sensors
Calibration Made Easy

A few years ago, we set out to engineer a way for our customers to calibrate their loggers and recorders, without ever having to send the devices back to us. What we ended up with was Replaceable Sensors.

What are these things?
Replaceable Sensors measure the temperature or humidity of your environment, and then send that signal to your data logger for storage. They are calibrated independently of the device.

What does that mean for you? If you calibrate your data loggers and chart recorders (which you should be doing) it means never, ever having to send your device back in to Dickson for a calibration. Replaceable Sensors take the phrase "down time" out of calibration.

Interested? Visit **dicksondata.com/replaceable-sensors** to watch a product video, and view products that use Replaceable Sensors.

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