

Metropolitan Board of Health of Nashville and Davidson County June 13, 2019 Meeting Minutes

The regular meeting of the Metropolitan Board of Health of Nashville and Davidson County was called to order by Chair Carol Etherington at 4:00 p.m. in the Board Room, on the third floor of the Lentz Public Health Center, 2500 Charlotte Avenue, Nashville, TN 37209.

Present

Carol Etherington, MSN, RN, Chair
Margreete Johnston, MD, MPH, Member
Tené H. Franklin, MS, Member
David A. Frederick, MS, Member
Wendy J. Long, MD, MPH, Director of Health
Sanmi Areola, PhD, Deputy Director
Hugh Atkins, REHS, Director, Environmental Health Services Bureau
Jim Diamond, MBA, Interim Director, Finance and Administration Bureau
Rachel Franklin, MBA, Interim Director, Communicable Disease and Public Health Emergency Preparedness Bureau
Tom Sharp, Policy Director
Angie Thompson, Director, Behavioral Health Services Division
Brian Todd, Communications Officer
Charlotte Weatherington, Marketing and Communications Coordinator
Gill C. Wright, III, MD, Civil Service Medical Examiner and Associate Medical Director, Clinical Services
Alex Dickerson, JD, Metropolitan Department of Law

Other Business

Brian Todd introduced Charlotte Weatherington, Marketing and Communications Coordinator, who joined the Department on June 10.

Director's Report

Dr. Long referred to her update provided in the Board packet (Attachment I).

Dr. Long also provided brief updates on the Nashville Health + Well-being Survey, Accreditation, and the Seniors Farmers Market Voucher program. Dr. Long advised that Dr. Areola would stand in for her at the July 11 Board meeting, as she would be attending the NACCHO Annual Conference, and that a more detailed update on Accreditation would be presented then.

Angie Thompson provided additional information on the "How Being Trauma-Informed Improves Criminal Justice System Responses" workshop mentioned in Dr. Long's update.

Food Establishment Inspections Update

Hugh Atkins presented an overview of the Food Protection and Public Facilities Division's processes in inspecting food establishments (Attachment II).

Rabies Exposure Protocol

Hugh Atkins presented an overview of Metro Animal Care and Control's rabies exposure protocol.

Approval of Immunizations Resolution

Tom Sharp presented an updated draft of the Immunizations Resolution (Attachment III).

Dr. Johnston made a motion to approve the Immunization Resolution as presented. Ms. Franklin seconded the motion, which passed unanimously.

Chair Etherington proposed submitting an op-ed by the Board and Dr. Long about the resolution to *The Tennessean*. Ms. Franklin suggested submitting an op-ed related to the Health Equity resolution within three months.

Approval of Grant Applications

Jim Diamond presented two items for approval.

- 1. ASPCA Emergency Rabbit Anti-Cruelty**
Term: May 1, 2019-August 1, 2019
Amount: \$26,092
- 2. Department of Justice Comprehensive Opioid Abuse Program**
Term: January 1, 2020-December 31, 2023
Amount: \$1,040,371

Approval of Grants and Contracts

Jim Diamond presented eight items for approval.

- 1. Grant from the State of Tennessee Department of Health, HIV-AIDS Core Medical & Early Intervention Services**
Term: April 1, 2019-March 31, 2020
Amount: \$54,700
- 2. Memorandum of Understanding with Behavioral Health Group – Point of Distribution (POD)**
Term:
Amount: NA
- 3. Grant from Tennessee Department of Health – Healthy Built Environment**
Term: June 1, 2019-May 31, 2020
Amount: \$20,000
- 4. Contract with University of South Carolina Masters of Public Health Affiliate**
Term: Execution +5 years
Amount: NA
- 5. Tennessee Department of Health Public Health Emergency Preparedness Amendment #2**
Term: July 1, 2017-June 30, 2022
Amount: \$26,901
- 6. Notice of Award #D from the Environmental Protection Agency – Air Pollution 105**
Term: October 1, 2014-September 30, 2019
Amount: \$278,747 (\$3,672,851 new project total)
- 7. Fee for Service Contract from the State of Tennessee Department of Health – Prenatal Presumptive Eligibility Grant**
Term: July 1, 2019-June 30, 2022
Amount: \$619,800
- 8. Contract with DentaQuest USA Insurance Dental Provider Service Agreement**
Term: Execution +1 year auto renewals (5 year max)
Amount: NA

Dr. Johnston made a motion to approve the grants and contracts as presented. Mr. Frederick seconded the motion, which passed unanimously.

Approval of the May 9, 2019 Meeting Minutes

Mr. Frederick made a motion to approve the minutes of the May 9, 2019 Board of Health meeting as written. Ms. Franklin seconded the motion, which passed unanimously.

Approval of the June 4, 2019 Retreat Minutes

Ms. Franklin made a motion to approve the minutes of the June 4, 2019 Board of Health retreat as written. Mr. Frederick seconded the motion, which passed unanimously.

Report of the Chair

Chair Etherington shared information about an event to be held July 12, 2019 at the New Beginnings Center, "Understanding Client Success in a Fitness Program Aimed at Low-Income Women," sponsored by the Meharry-Vanderbilt Community Engaged Research Core (CERC).

Chair Etherington also reminded Board members about the NashvilleHealth breakfast event Senator Frist would be hosting on Monday, June 17, to honor and welcome Dr. Long as the new Director of Health and as a NashvilleHealth Governing Board member.

Review of Board Requests

An update on Accreditation will be provided at an upcoming meeting.

CIVIL SERVICE BOARD

Approval of Extension of Probationary Period

Jim Diamond requested the Board extend by five months the probationary period for Shawanda Motlow so that her new supervisor would have adequate time to evaluate her performance.

Mr. Frederick made a motion to extend the probationary period for Shawanda Motlow by five months. Ms. Franklin seconded the motion, which passed unanimously.

Personnel Changes

Jim Diamond presented the Personnel Changes, which were unremarkable.

Next Regular Meeting

The next regular meeting of the Board of Health is scheduled to be held at 4:00 p.m. on Thursday, July 11, 2019, in the Board Room (third floor) at 2500 Charlotte Avenue, Nashville TN 37209.

The meeting adjourned at 5:32 p.m.

Respectfully submitted,

Carol Etherington, MSN, RN
Chair

Director's Update to the Board of Health April, 2019

Protecting Health – Preventing the Spread of Infectious Disease

Hep A, Measles & Vaccinations

Reported cases of hepatitis A remained at 205 for the county in the latest reporting period, continuing the trend of very modest increases we have seen in the last couple of months. With respect to measles, the state count remains at five cases, all linked to one family in East Tennessee.

The Tennessee Department of Health has issued its latest record of compliance with state immunization requirements for the 2018-2019 incoming kindergarten class. The numbers for Davidson County were solid: Full immunization for 94.2 percent of the 7,013 incoming public school kindergarteners (compared to the statewide rate of 94.8 percent); and 94.2 percent for the 658 incoming private school kindergarteners (compared to the statewide rate of 93.5 percent).

Improving Health - Services to Individuals & Families

Breast and Cervical Cancer

The Preventive Health clinic is coordinating with the Tennessee Breast and Cervical Screening Program (TBCSP) to make comprehensive screening available year-round to qualified patients. The primary objective is to detect cancers early by increasing the number of women who receive the screening. All services are offered free of charge to uninsured or underinsured residents of Tennessee. To assist with treatment of breast/cervical cancer, including precancerous conditions, women are referred to TennCare/Medicaid or an agency that provides financial assistance. The Preventive Health site at Lentz has two kick-off events in which the Mobile Mammogram Bus will be on the Lentz campus one last week and one June 21 from 9:00am to 2:30pm. Regular screening visits will be available at the Preventive Health Center starting June 10 during clinic hours (8:00 a.m. to 2:30 p.m.).

PrEP program

Pre-exposure prophylaxis

We began our Pre-Exposure Prophylaxis program to curtail the spread of HIV last week at the Sexual Health Center here. PrEP, for short, is for people at very high risk of HIV infection. The program calls for them to take HIV medicines daily. When used as prescribed – that is, taken every day – it is highly effective at preventing HIV. Daily use reduces the risk of contracting HIV from sex by more than 90 percent; among people who inject drugs, it reduces the risk by more than 70 percent. When used with other safe sex practices, such as consistent use of condoms, PrEP can lower the risk of infection even further. Our HIV program specialist will work to coordinate insurance coverage eligibility for patients, determine potential enrollment into Affordable Care Act plans, build community relationships and provide presentations to vulnerable populations that could take advantage of the program. Our HIV nurse practitioner will work to provide care to patients seeking PrEP services and determine patient eligibility, develop a plan for adherence and establish regular three-month follow-up.

Overdose deaths

The Medical Examiner's Office alerted us on June 4 to a spike in suspected overdose deaths that occurred over the weekend of May 31 in Middle Tennessee. There were a total of 21 deaths, 10 of

which were in Nashville. Five of the Nashville deaths were associated with the presence of an unknown white powder. Further details concerning the cause of death will not be available for some weeks, pending toxicology results. The deaths occurred in different parts of the county, not in a concentrated area. The spike raised concern that a particularly lethal illicit drug might have been circulating in the area and we took steps to notify our partners and the community. The ME's office will keep us updated concerning their investigations into these deaths and any additional deaths.

Improving Health – Access & Care Coordination

Ryan White Data Summit

The annual Ryan White Data Summit will be next week. The group will review the epidemiologic profile of the HIV population in the 13-county Transitional Grant Area, the types and amount of service categories used, and the gaps in service among the population. Recommendations for interventions from the Needs Assessment committee also will be presented. The attendees represent the Ryan White Planning Council, leadership from AIDS service organizations and community-based organizations, health care providers, Metro government officials and the community at large. The information is used by the council to set service priorities and to allocate funds from our HRSA grant for those categories. The Part A program takes those recommendations and creates RFPs and issues Metro contracts to the medical and support service providers in concordance with national guidelines and program standards of care. The program also monitors the providers on a regular basis which then feeds into our data collections on the needs of the community, starting the cycle once again.

Improving Health – Community Partnerships

Resilience Screening

Resilience: The Biology of Stress and the Science of Hope documentary screening for Metro Nashville boards, councils and commissions was hosted at the Omni on May 14. An estimated 80 people attended. Mayor Briley provided a welcome and presented a proclamation for May 14 to be “ACEs Awareness and Trauma-Informed Day of Action.” The screening was followed by a short discussion and call to action for the audience. The post-screening survey received 26 responses, with nine requests for additional documentary screenings, including two Metro departments, one academic institution, one community collaborative, and five community-based organizations.

Trauma Informed Criminal Justice

MPHD led the writing of a technical assistance grant from SAMHSA for a two-day, train-the-trainer workshop on: “How Becoming Trauma-Informed Improves Criminal Justice Responses.” Eighteen representatives from the fields of public health, criminal justice and community organizations participated in the training here in late May.

“How Being Trauma-Informed Improves Criminal Justice System Responses” is designed to increase understanding of trauma, create an awareness of the impact of trauma on behavior; and, develop trauma-informed responses.

Trauma-informed criminal justice responses can help to avoid re-traumatizing individuals, and thereby increase safety for all, decrease recidivism, and promote and support recovery of people with serious mental illnesses who have been involved with the justice system. Partnerships across systems can also help to link individuals to trauma-informed services and treatment.

The newly trained facilitators have committed to delivering the training to relevant stakeholders across Davidson County, including first responders, probation and parole personnel, attorneys, judges, and

anyone who serves people who have been involved with the system. These trainings will increase the capacity of those who interact with people in the justice system to do so in a way that is trauma-informed and aware of underlying behavioral health issues; moreover, we know that for many of the people committing low-level offenses who have mental health and substance abuse issues, that the “criminal” activity is a symptom of their behavioral health issue(s).

Organizational Updates

Budget

The Mayor’s budget proposal has moved through its public hearing and second reading at the Metro Council level. The Council’s substitute is expected to emerge into public view by no later than Monday, June 17. It is likely to include more substantial changes than is customary, as the Mayor has announced he will withdraw an effort to contract with a vendor for on-street parking services, which was valued in his original proposal at some \$30 million for FY20. An alternative budget including a 52-cent property tax increase also has been filed by individual Council members, although its prospects in the full Council are uncertain. None of these variants, however, has proposed changing the mayor’s original funding amount to MPHD.

EtE

Mayor Briley issued an executive order last week creating the Ending the Epidemic Advisory Council. Letters of appointment also were sent to appointed members of the Advisory Council. We will begin interviews for the Coordinator next week. This project will be housed in the Deputy Director’s Office at MPHD. The goal is to begin implementation of the EtE plan by July.

NATIONAL FEDERATION OF HUMANE SOCIETIES
BASIC ANIMAL STATS MATRIX
(vrs 9-2012)

IMPORTANT NOTES FOR THE BASIC DATA MATRIX

Introduction to the Basic Matrix:

This basic matrix was designed to serve as a tool for basic data collection. It is a simple matrix containing what many (including Asilomar, ASPCA, National Federation, American Humane, UC Davis, Maddies Fund, PetSmart Charities and HSUS) have agreed are the minimum data points (along with definitions) an organization should gather. Whether organizations already gather a great deal of data or have only gathered the basics, this matrix should facilitate the roll up or merging of data at the local, regional or national level by providing a common framework. This matrix does not reflect any preference in data analysis or the calculation of rates but is rather simply a tool for data collection.

Tracking by Species and Age:

The risks associated with being an adult dog, puppy, adult cat or kitten (or neonate of any kind) in a shelter environment will vary a great deal. To help shelters assess and understand the differing risks for these populations of animals, this basic animal stats matrix includes a break out by species and age. If tracking statistics broken out by species and age is beyond the capacity of an agency, simply tracking statistics by species would be a place to begin. This document defines puppy and kitten as under 5 months of age (see below: Determining Age). Again – given the differing level of risk – breaking age down further to include a neonate category for both dogs and cats can also be very informative.

Determining Age:

This basic matrix utilizes 5 months as the break point between puppy/kitten and adult. At or near 5 months of age there are changes in the teeth which can help guide trained staff regarding proper categorization of the animal. For cats, at 4-5 months of age permanent canines, premolars and molars are coming in (all in by 6 months of age). For dogs, at 5-7 months of age permanent canines, premolars and molars are coming in (all in by 7 months of age). Source: "How to . . . series" from Animal Sheltering, http://www.animalsheltering.org/resources/magazine/may_jun_1996/how-to-determine-a-dog-or.pdf or contact the National Federation of Humane Societies for a copy of the document.

Beginning and Ending Shelter Counts:

These numbers help frame the population of the animals sheltered and cared for by the organization. We are recommending that a shelter do a walk through – physically counting the animals sheltered within the organization, and not forgetting to count those animals who have been admitted but who are not currently within the shelter (foster care, in the care of a veterinary hospital, etc).

Defining Owner Requested Euthanasia:

Some shelters offer pet euthanasia to the public as a service whose cost may be subsidized and therefore more affordable than local veterinary clinics, thus ensuring access to this service. Defining when euthanasia should be recorded as "at the request of the owner", or not, is the subject of much discussion.

For the purposes of this document, we are choosing to define owner INTENDED euthanasia as the euthanasia of a pet whose owner brought the pet to the shelter for that service. In other words, the owner brought the pet in specifically for that service – it was their intent before arriving.

Any other definition of "owner requested" euthanasia leaves much up to interpretation and therefore a great deal of variation among organizations and their reporting. We believe the simplicity of this definition helps to ensure consistent application and record keeping.

Live Admissions Only

For the purposes of this matrix we are tracking LIVE admissions only, i.e. animals who are alive when they come into an agency's possession. Animals who are dead when taken in to an agency's possession may be a data point to track, but that information is not tracked by this matrix.

What is Possession?

"Adoption" and "Transferred to another Agency" both make reference to possession. The primary concept here is one of ownership. For example, in foster care, the agency still has possession or ownership. If adopted or transferred to another Agency, possession is now with the new owner, or with another Agency.

Where are the "Others"?

This basic data matrix focuses on canines and felines. Many organizations also provide extraordinary services for other pets (pocket pets, rabbits, ferrets) and animals (wildlife), and that good work is not captured here.

Why a Basic Matrix?

This basic matrix was designed to serve as a tool for data collection. It is a simple matrix containing what many have agreed are the minimum data points an organization should consider gathering. By agreeing to this basic matrix - we hope organizations will gather AT LEAST this data, or if an organization all ready gathers a great deal of data, that they will consider rolling up their data into this format to help facilitate (if individual agencies are interested) data collection at a local, regional or national level, which would allow participating agencies to benchmark their work against similar agencies around their region or the nation. This matrix does not reflect any preference for the variety of live release rates used in animal sheltering and welfare. Most rates, other than full Asilomar which requires a conditions matrix, should be able to be calculated from the data points included.

NATIONAL FEDERATION OF HUMANE SOCIETIES
BASIC ANIMAL STATS MATRIX
(vrs 9-2012)

Species By Age	Canine		Feline		Total
	Adult	Up to 5 months	Adult	Up to 5 months	
Beginning Animal Count (date: 05/01/2019)	93	3	43	26	165
Intake					
Stray at large	191	28	38	78	335
Relinquished by owner	57	1	22	19	99
Owner requested euthanasia	4	0	1	0	5
Transferred in from agency	1	0	0	0	1
Other Intakes	11	3	18	2	34
TOTAL INTAKE	264	32	79	99	474
Outcomes					
Adoption	134	19	41	26	220
Returned to owner	85	2	10	2	99
Transferred to another agency	38	9	10	15	72
Other live Outcome	0	0	0	0	0
TOTAL LIVE OUTCOMES	257	30	61	43	391
Died in care	0	0	2	0	2
Lost in care (Physical inventory adjustments)	0	0	0	0	0
Shelter Euthanasia	20	0	12	12	44
Owner requested euthanasia	3	0	0	0	3
TOTAL OUTCOMES	280	30	75	55	440
Ending Shelter Count (date: 10/31/2018)	91	7	53	48	199
SAVE RATE:	92.34%	100.00%	82.28%	87.88%	90.23%

METRO ANIMAL CARE AND CONTROL

Trailing 12 Monthly – Data Report

	May 2019	Trailing 12 Month Average Ending May 31, 2018
Intake Total	665	565
Stray	344	329
Owner Surrender	99	119
Owner Request Euthanasia	5	17
Wildlife	67	39
Other	124	28
Adopted	223	246
Transfer	87	105
RTO	99	108
ORE Euthanized	8	16
Wildlife Euthanized	48	27
Euthanasia Total	106	88
Euthanasia %	7%	9%

Data Report Key
Intakes
Outcomes

Food Service Establishments

Board of Health Meeting

June 13, 2019

Hugh Atkins, REHS

Bureau Director, Environmental Health



Metro Public Health Dept
Nashville / Davidson County
Protecting, Improving, and Sustaining Health

Food & Public Facilities Staff

- Managers:

Steve Crosier and Pam Wilson

- 4 Lead Env. Health Specialists:

Tommy Eubanks, Yvette Parks, Tiffany Stephens,
Ivone Rodriguez

Field Environmental Health Specialists

- Rachel Case
- David Guess
- Dale Krisle
- Danny Ripley (EHS Net)
- Keisa Burrell
- Jack Chapin
- Miroslava Colmenares
- Will Ellis
- Krystal Glynn
- Dorian Godboldt
- Jovian Hudson
- Amanda McDaniel
- Victor Oguntimehin
- Drew Ratzel
- Nick Richards
- Justin Wilson

Office Support Reps: Sherry Lockett, Monica Rodriguez, Erika Smith

4,804 Food Service Establishments in Nashville

- Commercial/Restaurants – 4,144
- Mobile Food Units – 255
- School Cafeterias – 197
- Day Care Food Service – 190
- Temporary Food

Food safety rules based on FDA Food Code

- PIC must demonstrate knowledge of food safety
- Employee health policy
- No bare-hand contact with ready-to-eat food
- Time as a public health control

Risk-based Inspections

- The number of inspections is based on risk categories.
- The inspections focus of risk factors that contribute to foodborne illness outbreaks (Priority/Priority foundation items).

Risk Categories

- Category 1:
 - Establishments that serve only pre-packaged, non-TCS foods
 - Establishments that heat only commercially processed TCS foods for hot holding
 - Establishments that, through historical documentation, can demonstrate they have managerial control of foodborne illness risk factors

Risk Categories

- Category 2:
 - Establishments that prepare/cook and serve immediately
 - Routine cooking, cooling, and reheating for hot holding is limited
 - Newly-permitted Category 1 establishments until an inspection history demonstrates managerial control over foodborne illness risk factors

Risk Categories

- Category 3:
 - Extensive menu and handling of raw ingredients
 - Complex preparation of TCS foods requiring cooking, cooling, and reheating for hot holding is limited
 - Category 2 establishments that, through historical documentation, cannot demonstrate active managerial control of foodborne illness risk factors

Risk Categories

- Category 4:
 - Hospitals, nursing homes, and other establishments serving a highly susceptible population
 - In Tennessee, the Division of Health Care Facilities (TN Department of Health) regulates these establishments
 - Category 3 establishments that, through historical documentation, cannot demonstrate active managerial control of foodborne illness risk factors

Top 5 risk factors for foodborne illness outbreaks:

- Improper hot/cold holding temperatures of TCS food.
- Improper cooking temperatures of food.
- Dirty and/or contaminated utensils and equipment.
- Poor employee health and hygiene.
- Food from unsafe sources.

Follow up inspections:

- The permit holder is to correct priority items at the time of the inspection.
- Depending on the hazard involved and the complexity of the corrective action needed, the department may agree to a longer time frame (not to exceed 10 days) for the permit holder to correct violations of priority items.
- EHS conducts follow-up inspections to verify correction.

Field staff conducting inspections on iPads

- Eliminates filling out multiple forms
- Inspections uploaded into a database; scores go directly on the Internet
- Eliminates the need for EHS to manually enter inspection results into a computer
- Inspection data are more easily tracked, sorted, and reported



Thank You!

hugh.atkins@nashville.gov | 615-340-0478



Metro Public Health Dept

Nashville / Davidson County

Protecting, Improving, and Sustaining Health



Metro Public Health Dept

Nashville / Davidson County

Protecting, Improving, and Sustaining Health

Resolution

- WHEREAS,** The Board of Health for Metropolitan Nashville and Davidson County fully supports the mission of the Metro Public Health Department to protect, improve and sustain the health of all people in Davidson County; and,
- WHEREAS,** There have been few if any public health interventions as successful as vaccinations at improving health and increasing life expectancy ⁽¹⁾; and,
- WHEREAS** It is estimated that vaccines still save between 2.5 and 3 million lives worldwide every year ⁽²⁾; and,
- WHEREAS,** The vaccines recommended by the CDC for the prevention of disease in children and adults have been proven to be safe, and are continuously monitored through several safety systems ⁽³⁾; and,
- WHEREAS,** Studies have shown there is no link between vaccines and autism ⁽⁴⁾; and,
- WHEREAS,** Vaccines protect not only those who receive them, but also those who are too medically frail or otherwise unable to receive the vaccinations themselves, through what is called 'herd immunity' ⁽⁵⁾; and,
- WHEREAS,** Vaccination rates have dipped below optimum in some pockets of the United States, leading to isolated outbreaks of vaccine-preventable diseases ^(6,7) and unnecessary suffering; and,
- WHEREAS,** The most recent survey of vaccination rates for 24-month-olds in Davidson County indicates an increase compared to prior years in the percentage of sampled parents who are choosing for non-medical reasons not to immunize their children ⁽⁸⁾; and,
- WHEREAS,** In a world where the success of vaccinations over many generations has obscured the devastation these diseases can cause, the Board of Health remains acutely aware of these dangers; and,
- WHEREAS,** The Board of Health does not wish to see needless suffering visited on the citizens of Davidson County;

NOW, THEREFORE BE IT RESOLVED that the Metropolitan Board of Health of Nashville and Davidson County, on this 13th day of June, 2019,

- 1) Encourages parents to immunize their children fully, and encourages adults to get an annual flu shot as well as other recommended immunizations based on age or risk factors; and,
- 2) Encourages health care providers to take every opportunity to promote and provide immunizations to their patients; and,
- 3) Supports and encourages efforts at the state level to reduce or eliminate allowable non-medical exemptions from vaccination.

Carol Etherington, MSN, RN, Chair
Metropolitan Board of Health of Nashville/Davidson County

Board of Health:

Carol Etherington, MSN, RN
Chair

A. Alex Jahangir, MD, MMHC
Vice Chair

Thomas W. Campbell, MD
Member

Tené Hamilton Franklin, MS
Member

David A. Frederick, MS
Member

Margreete G. Johnston, MD, MPH
Member

¹ Centers for Disease Control and Prevention, Morbidity and Mortality Weekly Report, April 2, 1999, accessed at: <https://www.cdc.gov/mmwr/preview/mmwrhtml/00056803.htm>

² World Health Organization, "10 Facts on Immunization," updated March, 2018, accessed at: <https://www.who.int/features/factfiles/immunization/en/>

³ Centers for Disease Control and Prevention, "Vaccine Safety," accessed at: <https://www.cdc.gov/vaccinesafety/iso.html>

⁴ Centers for Disease Control and Prevention, "Vaccine Safety," accessed at: <https://www.cdc.gov/vaccinesafety/concerns/autism.html>

⁵ U.S. Department of Health and Human Services, accessed at: <https://www.vaccines.gov/basics/work/protection>

⁶ Centers for Disease Control and Prevention, "Vaccines and Immunizations," accessed at: <https://www.cdc.gov/vaccines/vac-gen/whatifstop.htm>

⁷ The New York Times, "Largest U.S. Measles Outbreak in 25 Years Surpasses 980 Cases," Weiyi Cai, Denise Lu and Scott Reinhard, updated June 3, 2019, accessed at: <https://www.nytimes.com/interactive/2019/health/measles-outbreak.html>

⁸ Tennessee Department of Health, "Results of the 2018 Immunization Status Survey of 24-month Old Children in Tennessee," accessed at: <https://www.tn.gov/content/dam/tn/health/documents/annual-reports/2018-Annual-Imm-24-Month-Old-Survey.pdf>