Vector Control Workshop

Montgomery, Alabama

January 15, 2019

Wifi: Hilton Honors Meeting
Promotional code: ESConf

NACCHO
National Association of County & City Health Officials

Building Capacity in Local Vector Control Programs Across the United States

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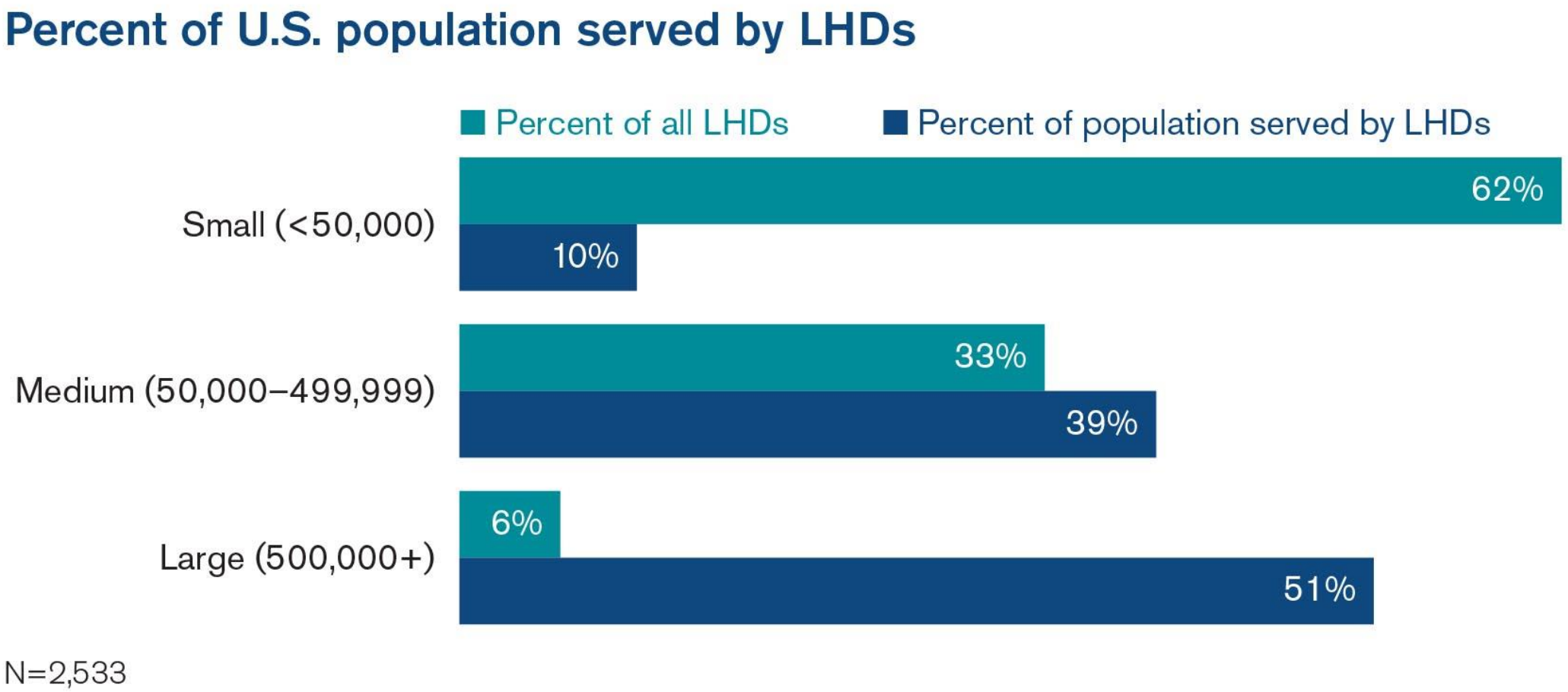
NACCHO
National Association of County & City Health Officials

Mission

NACCHO
National Association of County & City Health Officials

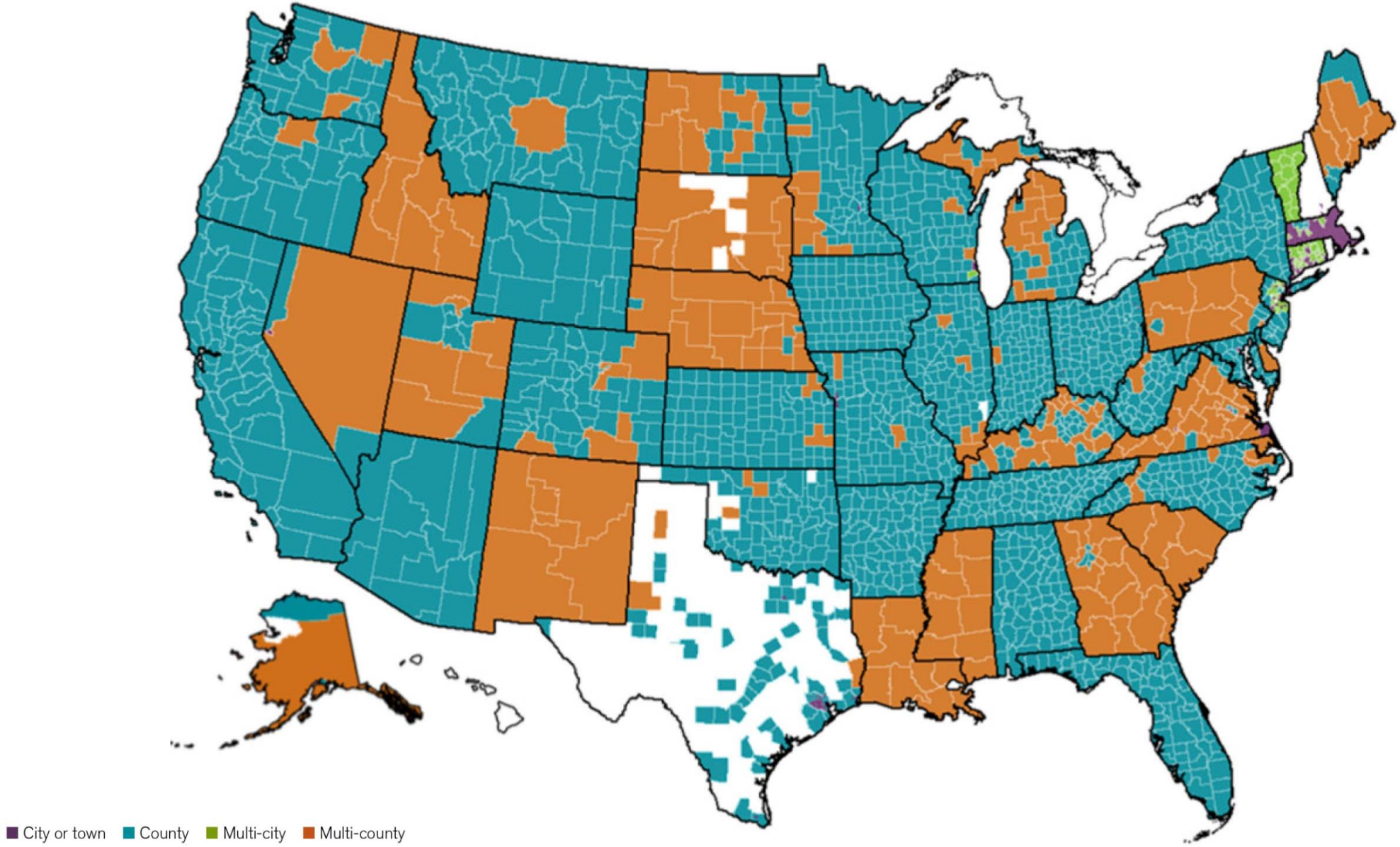
NACCHO is comprised of nearly **3,000 local health departments** across the United States. Our mission is to serve as a **leader**, **partner**, **catalyst**, and **voice** with local health departments.

Landscape



Source: National Association of County and City Health Officials (NACCHO) 2016 National Profile of Local Health Departments

Geographic Jurisdictions Served by LHDs



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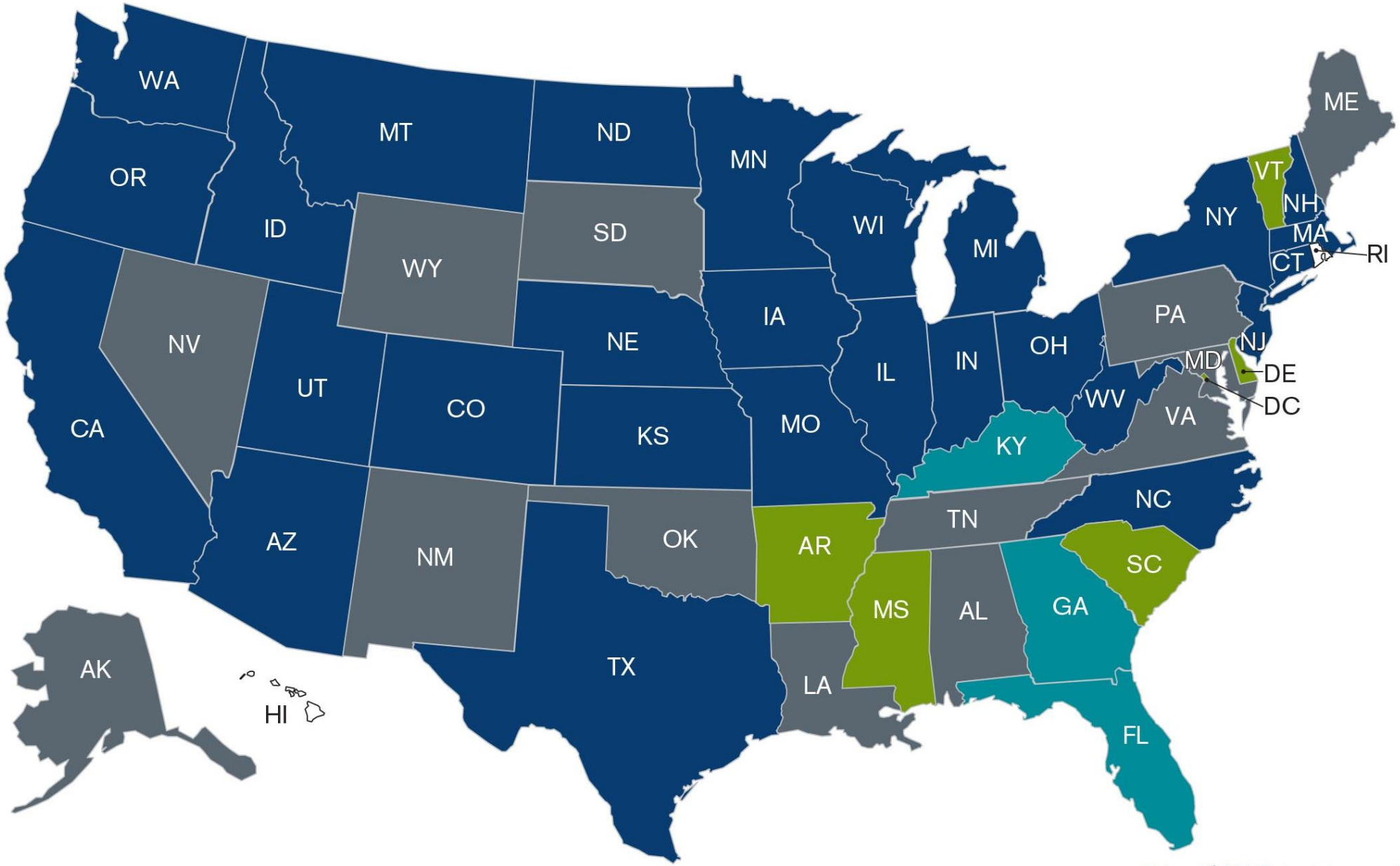


RI and HI non-participants.

N=2,533

- Local (all LHDs in state are units of local government)
- State (all LHDs in state are units of state government)
- Shared (all LHDs in state governed by both state and local authorities)
- Mixed (LHDs in state have more than one governance type)

Source: National Association of County and City Health Officials (NACCHO) 2016 National Profile of Local Health Departments

Essential Public Health Services

Source: Centers for Disease Control and Prevention. (2014). *The 10 Essential Public Health Services: An Overview.* Retrieved Jan 22, 2018 from https://www.cdc.gov/stltpublichealth/docs/usph101.pptx

Voice of Local Health Departments *Advocacy*

•NACCHO priorities are established by the Board of Directors annually.

Primary focus:

- Increasing understanding of role of local health departments in communities
- Federal funding to support local programs
- Legislation that establishes and continues key (authorizing) federal programs

More info: http://www.naccho.org/advocacy

Big Cities Health Coalition (BCHC)

- Made up of 28 health officials from large/dense urban cities/counties
- Serve 52 million or 1 in 6 Americans
- Works on local and national policy solutions and federal advocacy
- Maintains a forum to share best practices
- Coordinates with NACCHO staff working with big cities

www.bigcitieshealth.org

BCHC Member Cities

- Atlanta (Fulton County)
- Baltimore
- Boston
- Chicago
- Cleveland
- Dallas
- Denver
- Detroit
- Fort Worth (Tarrant County)
- Houston
- Kansas City
- Las Vegas (Southern NV Hlth District)
- Los Angeles (County)
- Long Beach
- Miami (Miami-Dade County)
- Minneapolis
- Multnomah County (Portland)
- New York City
- Oakland (Alameda County)
- Philadelphia
- Phoenix (Maricopa County)
- Sacramento
- San Antonio
- San Diego (County)
- San Francisco
- San Jose (Santa Clara County)
- Seattle (Seattle-King County)
- Washington, D.C.

NACCHO's Rural Health Section

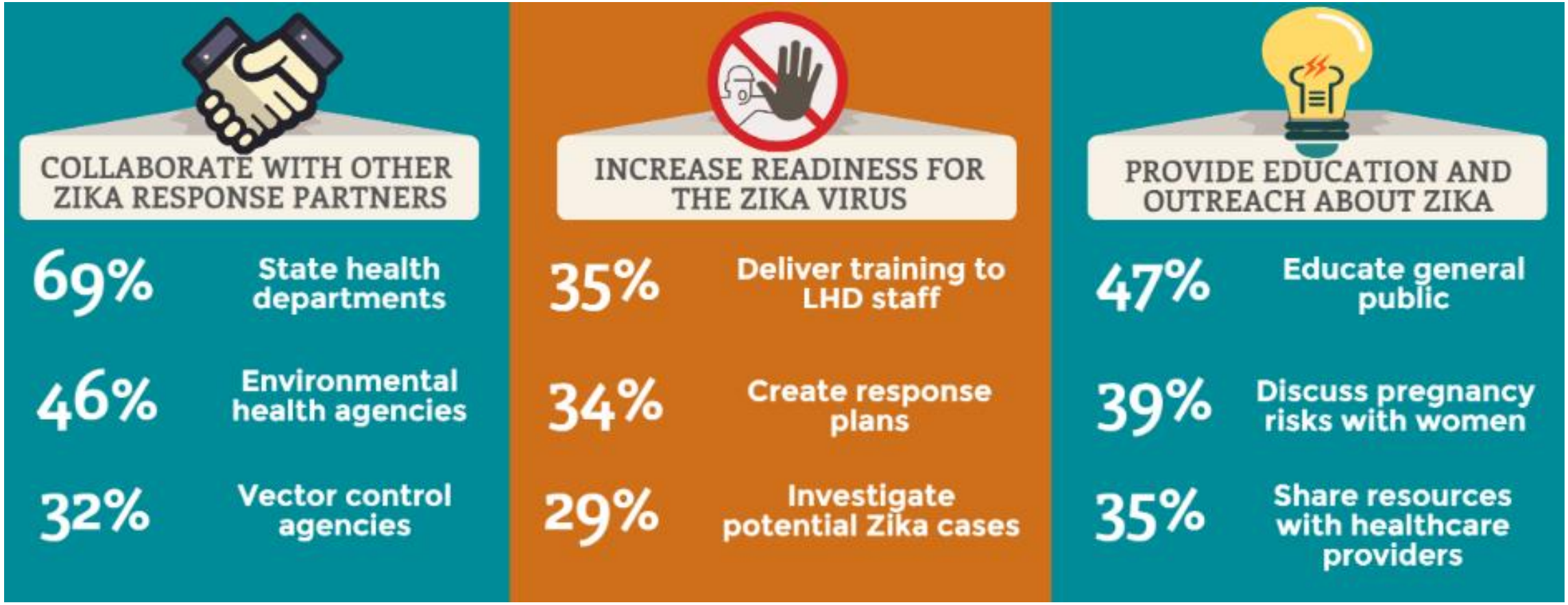
- Rural Americans are more likely to die from heart disease, cancer, unintentional injury, chronic lower respiratory disease, and stroke than their urban counterparts.
- Focus Areas:
  1. Increased Adoption of Healthy Behaviors
  2. Improving Community Involvement in Health System Governance
  3. Improving Health System Governance and Finance.
  4. Improving Workforce Capacity
  5. Improving Information and Data Use for Decision Making
  6. Identifying Stakeholders & Partners

Local Health Departments and Zika

NACCHO
National Association of County & City Health Officials
The National Connection for Local Public Health

Source: NACCHO. (2017). Zika in the United States infographic. Retrieved November 26, 2017 from https://www.naccho.org/uploads/downloadable-resources/Zika-In-the-U.S.-Infographic-DigitalVersion-FINAL-1.pdf

Experiences and Lessons Learned



NACCHO
National Association of County & City Health Officials
The National Connection for Local Public Health

Source: NACCHO. (2016). Local health departments need funding now infographic. Retrieved November 26, 2017 from https://www.naccho.org/uploads/downloadable-

Results: Strategies that work

- Broaden existing campaigns to focus more generally on "Fight the Bite" messaging
- Invest in provider communication to improve reporting

- Utilize a One Health framework to address the multidisciplinary needs of the response and maximize limited staff
- Develop and maintain community partnerships before an emergency. Establish credibility as a trusted resource among these partners

- Partner with schools and neighborhood associations to engage residents in trapping mosquitoes for surveillance
- Implement a vector control fee to support and sustain vector control activities

Results: Challenges Experienced

Planning and Response

- Reviewing administrative preparedness

Communication/Community Education

Provider Audience:

- Keeping up with changes in case definitions and testing guidelines
- Verifying information shared is being utilized
- Partnering with maternal and child health providers

Public Audience:

- Messaging around multiple modes of transmission
- Overcoming language barriers
- Creating messages to motivate but not scare people
- Balancing Zika with other public health threats
- Managing pressure from community to respond

Results: Challenges Experienced

Vector Control

- Improving poor communication between human and vector surveillance
- Overcoming lack of capacity
- Managing logistical challenges with spraying during the day

Human Surveillance

- Overcoming the lack of interoperability between surveillance systems
- Missing cases due to absence of symptoms
- Keeping up with changing case definitions
- Monitoring travelers and communicating with travel-related agencies
- Conducting surveillance in border communities
- Participating in fetal surveillance activities
- Outreaching to pregnant women

Laboratory Testing

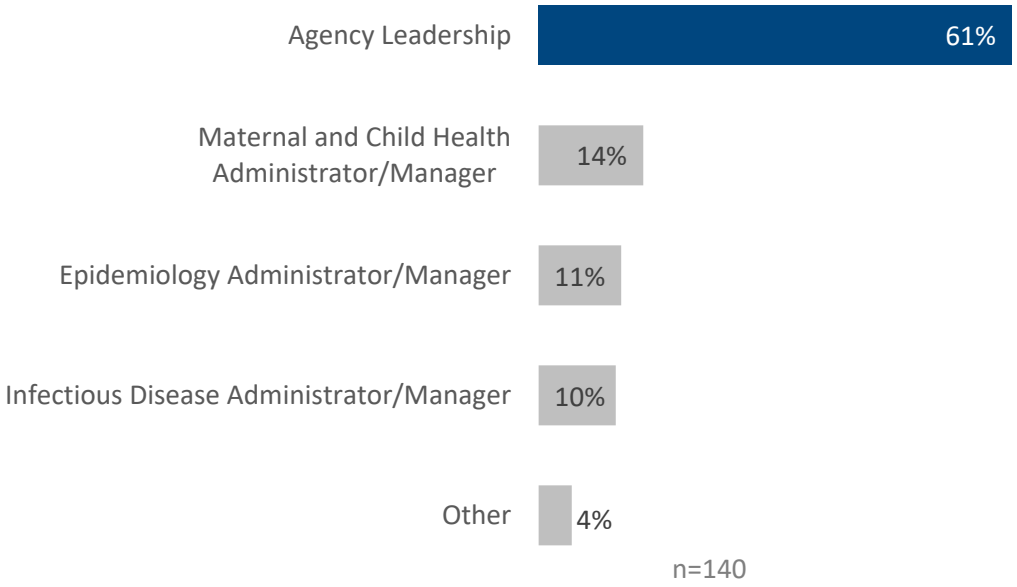
- Knowing which tests to use
- Keeping up with changing testing guidelines
- Dealing with testing methods reliability

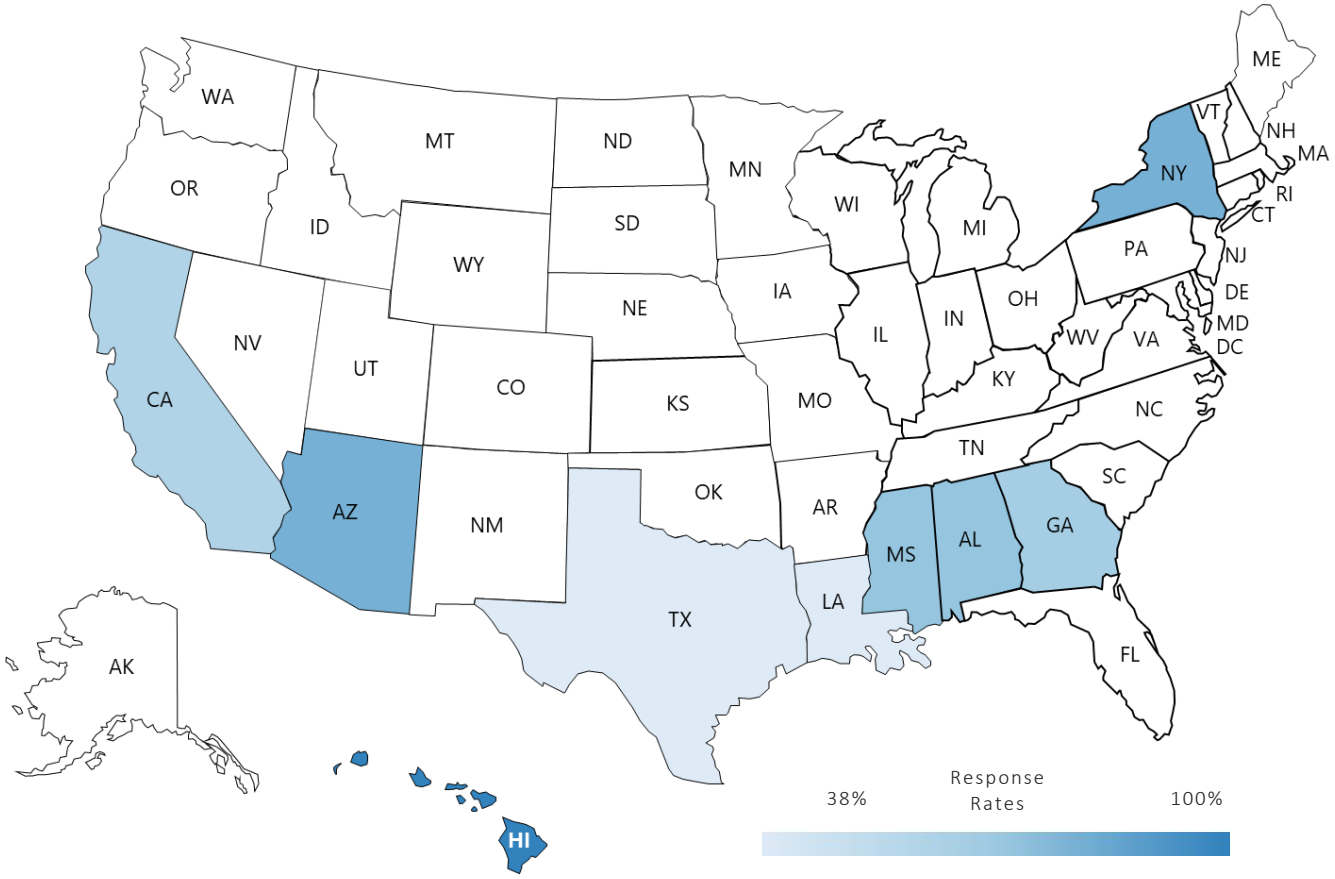
Maternal Child Health Capacity for Zika Response

LHD MCH Zika Capacity Assessment Response Characteristics

- Most survey respondents were agency leadership, such as the local health officer or health department director.
- Response to the MCH Zika Capacity Assessment was received from 9 of the 10 high-priority states identified. On average, 65% of LHDs, regional/district offices, and state offices responded to the assessment in each state.

Role of LHD respondent





MCH Zika Assessment Conclusions

- This report is the first report of an assessment of the organizational capacity of LHDs and their MCH programs, in high-risk jurisdictions, to monitor, track and support pregnant women and/or infants potentially affected by the Zika virus.

- **Key Findings**

- **Over 80% of LHDs have formal and/or informal communication and referral mechanisms between their MCH programs and key programmatic areas within their agency.** Referrals between key programmatic areas can support identification and follow-up efforts of pregnant women and/or infants potentially exposed to the Zika virus.

- **Seventy-eight percent (78%) of LHDs have access to electronic lab results**. LHDs receiving electronic lab results are more likely to report to local, state, and federal disease surveillance systems.

Disease surveillance and monitoring is an essential public health service of LHDs. Access to lab results allows LHDs to plan adequate response to the burden of disease within their communities.

LHDs are actively engaged in community-level Zika response activities. Over two-thirds of LHDs are currently or have participated in response activities including providing information to travelers about Zika risk and protective measures, providing clinical outreach and communication, supporting lab testing, and conducting MCH surveillance.

LHDs are less likely to provide screening and testing services to identify potential birth defects in infants. Seventy-one percent of newborn screening and 73% of vision and hearing testing were provided by other entities within LHD jurisdictions.

- **Limitations**

- Governance of LHDs in each state varies. Due to state preferences, the MCH assessment was not disseminated to each LHD in every state. Therefore, the results of the survey may not be broadly attributable to individual LHD capacity.

- Resources, or lack thereof, to support MCH and Zika response activities was not addressed in this assessment. Therefore Zika response activity engagement by the LHD is not understood in relation to the available resources in the community.

- Due to the 58% response rate, the presented responses may not reflect all LHD MCH Zika response capacity.

Mosquito Control Capabilities in the U.S.

Mosquito Surveillance and Control Assessment and Ranking

A scoring matrix was created to prioritize or weight questions based on necessary capabilities of a competent vector control program. Using the CDC framework[2,3] for vector control competency as guidance, five core competencies were used to rank each organization as **Fully Capable**, **Competent**, or **Needs Improvement**.

Definitions

A **Fully Capable** vector control organization performs all core and supplemental competencies.

A **Competent** vector control organization performs all core competencies.

A **Needs Improvement** vector control organization fails to perform one or more core competency.

Core Competencies

1. Routine mosquito surveillance through standardized trapping and species identification
2. Treatment decisions using surveillance data
3. Larviciding, adulticiding, or both
4. Routine vector control activities (e.g., chemical, biological, source reduction, or environmental management)
5. Pesticide resistance testing

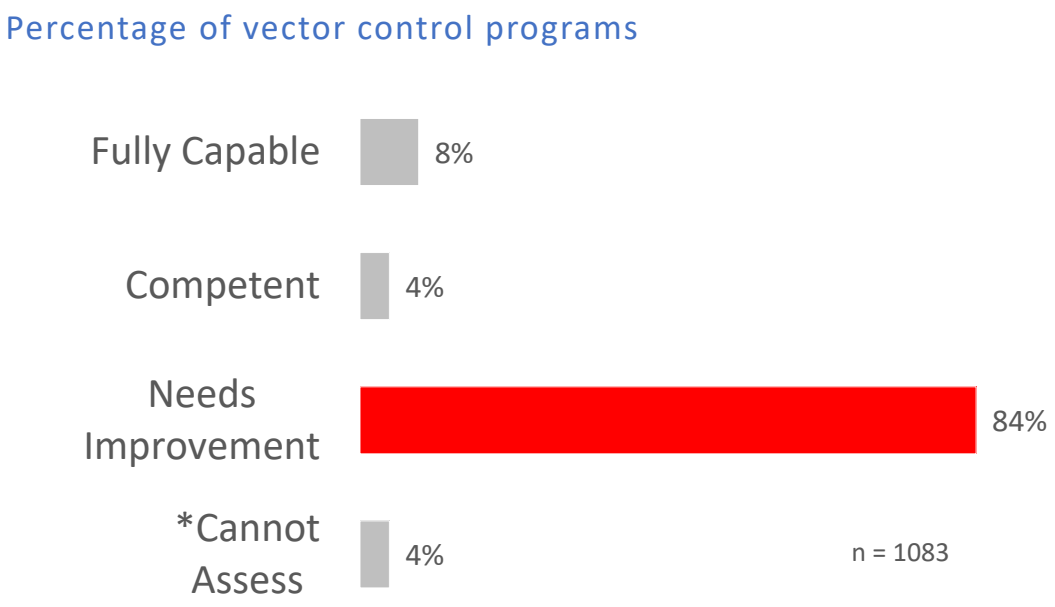
Supplemental Competencies

6. Licensed pesticide application
7. Vector control activities other than chemical control (e.g., biological, source reduction, or water management)
8. Community outreach and education campaigns regarding mosquito-borne diseases, how they spread, and how to prevent infection
9. Regular communication with local health departments regarding surveillance and epidemiology
10. Outreach (e.g., communication and/or cooperation) with nearby vector control programs

The overwhelming majority of vector control programs are in need of improvement

The assessment revealed that, based on the standards for competency developed and promoted by CDC and AMCA, **84% of respondents are in need of improvement** in at least one core competency area.

*Partially completed assessments were included for data analysis but could not be ranked for competency.

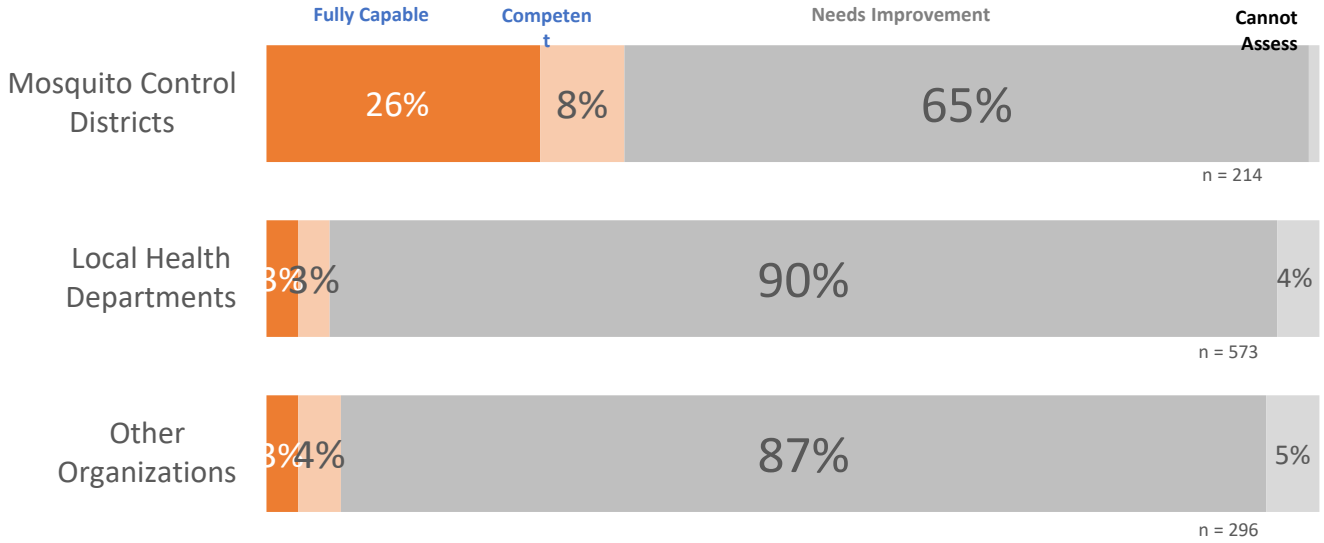


The level of vector control capability varies by organization type

- Vector control programs are carried out by a variety of organizations across the U.S. Overall, they can be classified into three categories: **Local Health Departments**, **Mosquito Control Districts**, and **Others**.

- "Other" includes a variety of city/local governmental agencies (e.g., public works departments, street and sanitation departments, Tribal networks, environmental health services, parish police juries, parks and recreation departments, weed and pest departments, and utilities departments).

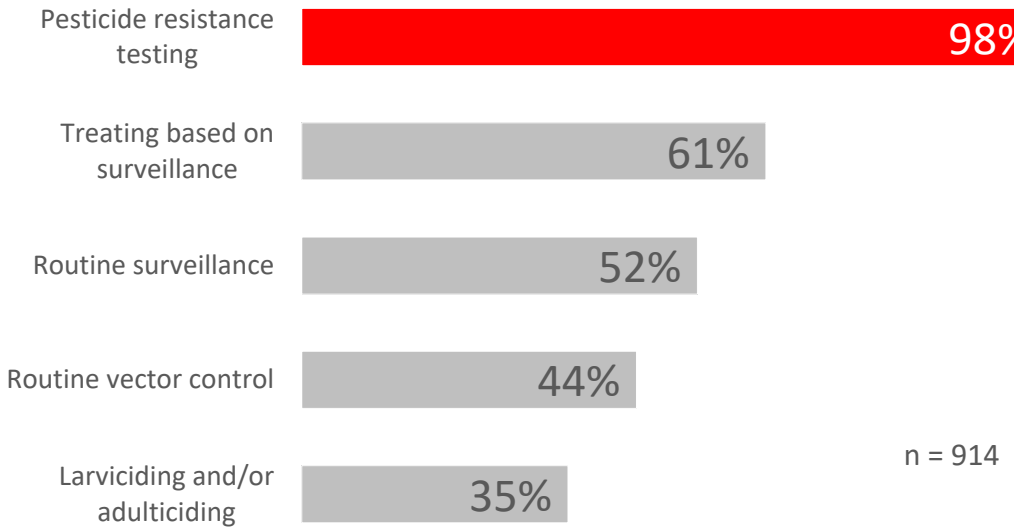
- These results reveal differences in mosquito surveillance and control capabilities based on organization type. For example, **mosquito control districts outperform** both local health departments and other city or local governmental agencies.



Pesticide resistance testing is the greatest competency gap for vector control programs

- Of the vector control programs ranked as **Needs Improvement**, nearly all of them (98%) lack the capability or capacity to perform pesticide resistance testing.
- More than half of these programs also lack capability in performing routine surveillance and species identification. Furthermore, gaps in competency exist related to using that surveillance data to make treatment decisions

Percentage of "needs improvement" vector control programs lacking each core competency



Routine standardized surveillance is NOT ROUTINE for all vector control programs

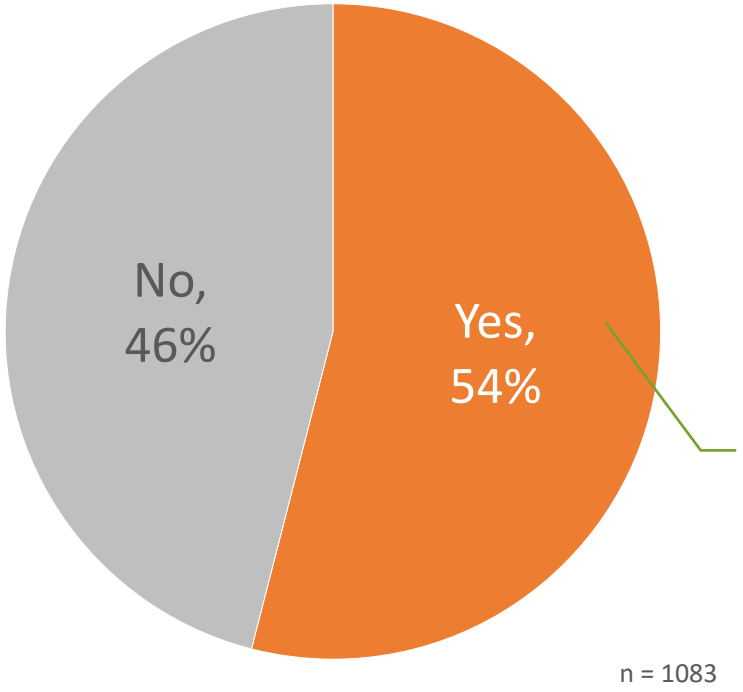
Mosquito surveillance involves species identification, abundance, and spatial distribution within a geographic area through the collection of eggs, larvae, and adult mosquitoes. It is necessary for:

- Monitoring changes in abundance and species distribution;
- Evaluating control efforts; and
- Informing intervention decisions.[4]

46% of programs do not perform routine standardized surveillance.

Of those that do perform routine surveillance, 15% reported NOT using this information to inform mosquito-borne disease treatment decisions.

Percentage of vector control programs conducting routine surveillance for mosquitoes



Of these, 85% of vector control programs reported using the information gathered to make treatment decisions.

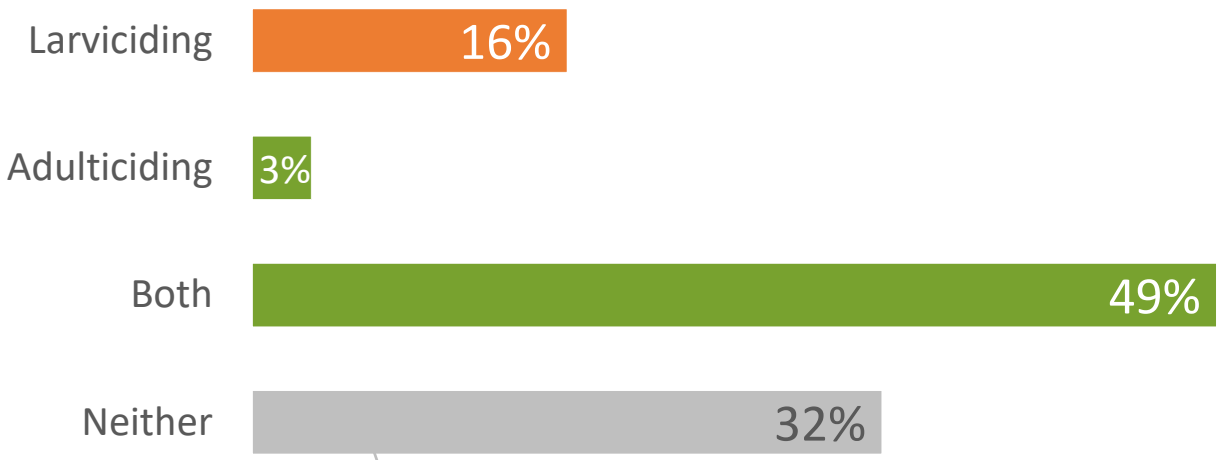
Chemical mosquito abatement is performed by most vector control programs

Larvicides (biopesticides and chemicals) inhibit the growth of mosquito larvae thereby reducing the number of adult mosquitoes in a given area.

Adulticides (insecticides) are toxic to mosquitoes, killing them via direct contact. Surveillance data is critical to justify the use of adulticides.

Chemical abatement using larvicides, adulticides, or a combination **is performed by the majority (68%) of vector control programs.**

Percentage of vector control programs conducting larviciding and/or adulticiding



n = 1076

Nearly one third of vector control programs do not perform any chemical abatement activities, leaving their communities at risk.

Vector control programs often lack pesticide resistance testing

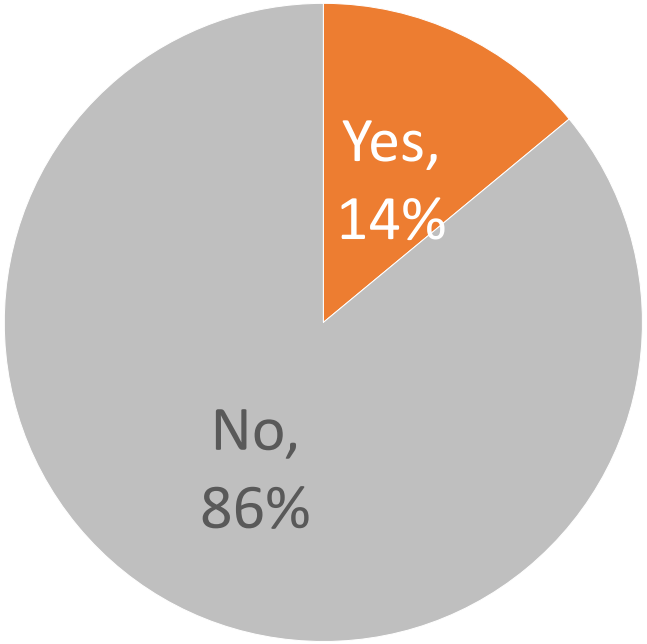
Pesticides and insecticides are chemicals used to control both larvae and adult mosquitoes. Mosquitoes repeatedly exposed to these chemicals over time can develop resistance.[3]

Pesticide resistance is an overall reduction in the ability of an insecticide to kill mosquitoes.

Of the responding vector control organizations, **86% do not perform pesticide resistance testing.**

To prevent or delay pesticide resistance from developing, vector control programs should include resistance testing, monitoring, and management.[4]

Percentage of vector control programs conducting pesticide resistance testing



n = 1048

Alternatives to chemical control are not universally applied

Alternatives to chemical control of mosquitoes include:

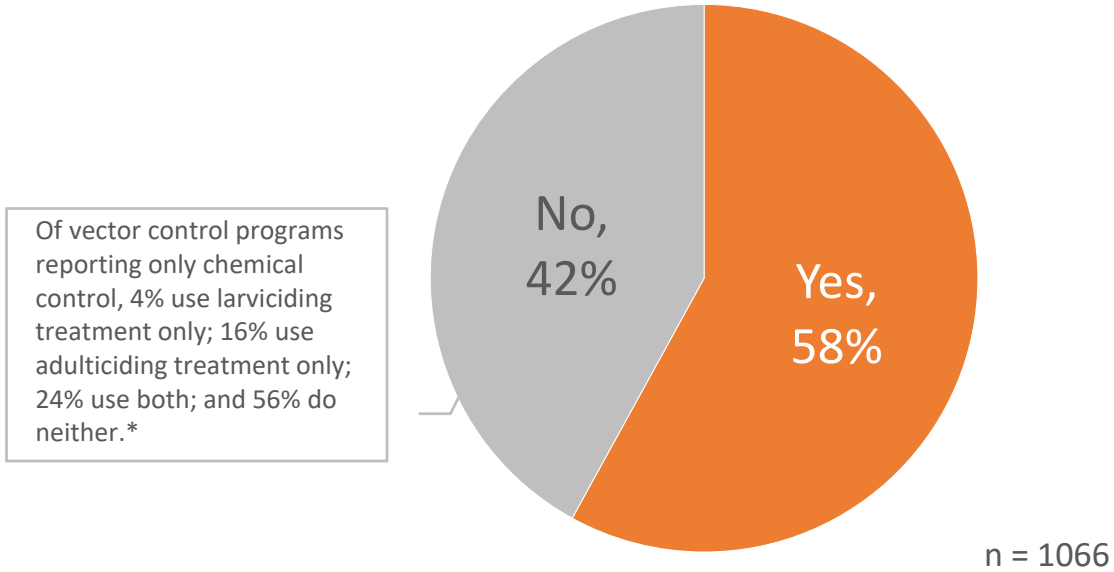
Larval source reduction is the most effective means of vector control. Mosquito larvae develop in standing, fresh water: through environmental modifications you can limit the water sources thereby reducing mosquito larvae

Biological control entails using biological organisms to manage mosquitoes. These can include: aquatic predators and genetically modified organisms.

58% of programs perform non-chemical abatement activities, 42% do not.

*Of the programs reporting no non-chemical abatement, 56% do not perform any abatement activities, including chemical.

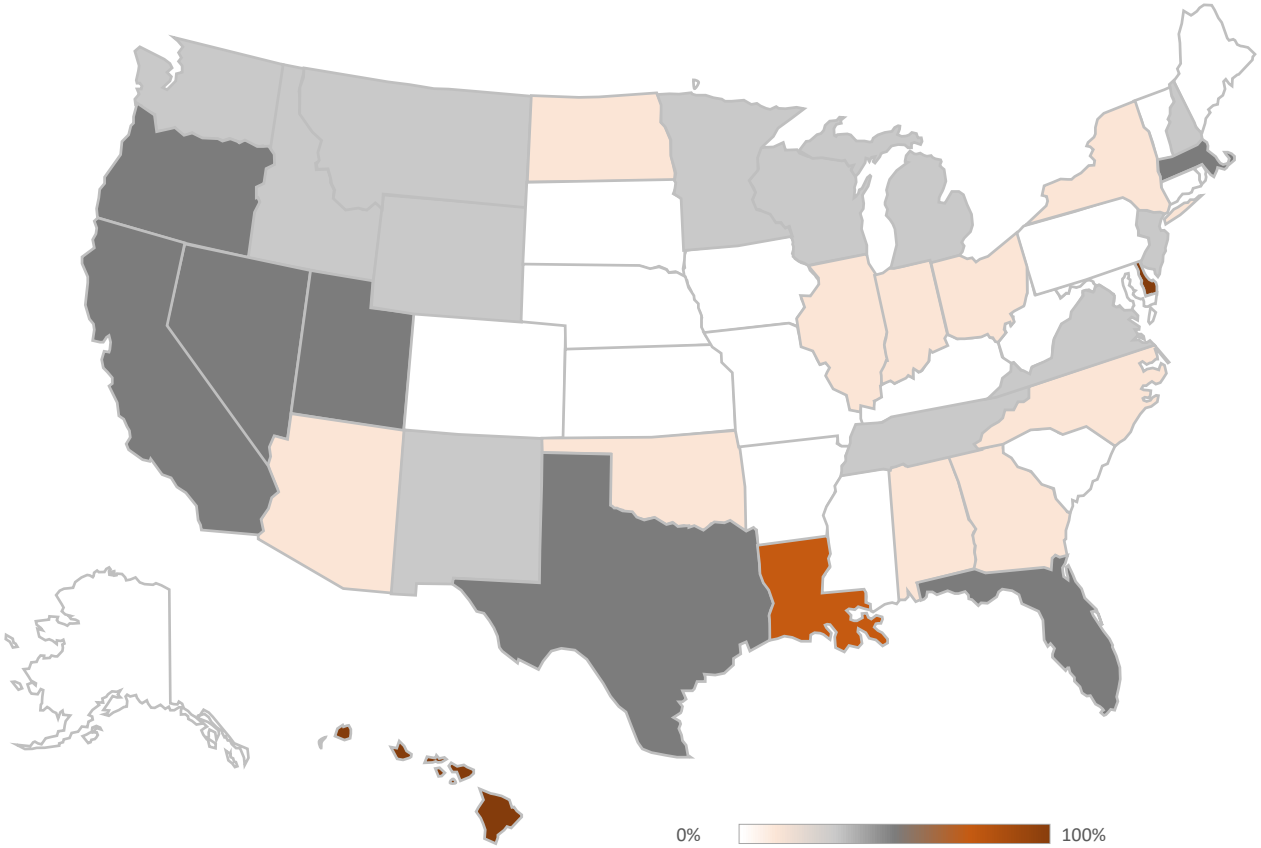
Percentage of vector control programs engaging in control activities other than chemical control



Vector control program competency varies across the United States

- If you combine the fully capable and competent vector control programs in each state, the data reveals that **33 states had at least one vector control program meeting all core competencies**.
- All vector control programs in 17 states were rated needs improvement, indicating none of their vector control programs meet all core competencies.

Percentage of vector control programs ranked as “fully capable” or “competent” by state



Limitations and Conclusions

- This report describes the first nation-wide baseline assessment of mosquito surveillance and control activities across the U.S. This national report provides comparable data on baseline mosquito control programs to help identify local agencies' preparedness for mosquito-borne virus outbreaks.
- A comprehensive understanding of mosquito surveillance and control activities in the U.S. is necessary to identify gaps and needs specific to vector control. As illustrated here, **84% of vector control programs in the country have been identified as "needs improvement"** in one or more core competency.
- Reviewing the areas in which vector control programs need improvement can inform decision-makers of the top vector control priorities when allocating resources.

Top Vector Control Priorities:

1. Pesticide resistance testing;
2. Treating based on surveillance data;
3. Routine mosquito surveillance and species identification;
4. Routine, species-specific vector control;
5. Larviciding and/or adulticiding; and
6. Non-chemical vector control (e.g., biological, source reduction, water management).

Challenges and Gaps

- Vector control programs are structured and operated differently in each jurisdiction.
- Resources, or lack thereof, to support vector control programs was not addressed.
- Due to the 57% response rate, the presented responses may not reflect all vector control programs.
- Only publicly-funded vector control programs were assessed. Any town or jurisdiction that contracted out services was expected to complete the survey based on the terms of their contract.

Recommendations

- **Increase mosquito surveillance and control capacity through:**
- Providing quality and ongoing staff training in standard mosquito surveillance and control techniques;
- Increasing awareness of the importance of pesticide resistance testing and the proper training to perform it routinely;
- Forming mosquito control districts (34% of mosquito control districts perform all core competencies versus 6% and 7% of local health departments and other organizations, respectively); and
- Ensuring sustainable funding and resources are dedicated to local vector control programs to maintain properly trained staff and adequate supplies to perform chemical and non-chemical abatement activities.

- **Decrease barriers to mosquito surveillance and control competency through:**
- Identifying the barriers to routine mosquito surveillance and pesticide resistance testing;
- Bolster public communication strategies to educate property and home owners on eliminating mosquito breeding grounds;
- Supporting data collection and sharing across jurisdictions to monitor mosquito species and density over time and pre-/post-control activities; and
- Ensuring all mosquito control decisions are supported by surveillance data with appropriate thresholds.

Without federal funding, counties brace to confront Zika on their own

Lena H. Sun

As Zika season looms, Senate panel approves $100 million in mosquito control funding

By Kate Irbykirby@mcclatchy.com

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A group of aedes aegypti mosquitoes in a mosquito cage at a laboratory in Cucuta, Colombia. The World Health Organization has said it may be necessary to use controversial methods like genetically modified mosquitoes to wipe out the insects that are spreading the Zika virus across the Americas.

LOUISIANA DEPARTMENT OF HEALTH

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Secretary
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Health Department Offers Funding for Local Mosquito Control Efforts

New grant to fund surveillance-based mosquito control in areas without existing mosquito abatement districts

September 28, 2018

Funding is now available to help local communities start new mosquito control programs. Using a one-time grant of $1 million from the federal Centers for Disease Control and Prevention (CDC), the Louisiana Department of Health is now offering funding to local governments to help them establish new mosquito control programs.

With the funding from the CDC, the Louisiana Department of Health will award four individual grants to parishes or municipalities that currently do not have an in-house mosquito abatement district. Those who receive the grants from the Louisiana Department of Health can use the money to purchase equipment and supplies to jump-start local mosquito control efforts.

Local governments must apply for the funding from the Department. The amount of each individual award will be adjusted depending on the number of qualified applicants. To enhance surveillance and control efforts, the funding may also be awarded to an existing mosquito abatement district in which local transmission of Zika virus is discovered.

Earlier this month, the Department provided funding of $250,000 to both St. Mary and Assumption parishes. Kyle Moppert, state medical

Moore receives funding for mosquito control

RYTC presents 'The Hobbit' at Sunset Theatre

Most Popular Our Picks

CARTHAGE — Moore County has received money to fund mosquito control in the wake of Hurricane Florence, the nation's second-rainiest storm in the last 70 years.

According to health officials, the population of mosquitos that has emerged in this area does not transmit human disease, and poses no serious public health threat.

Gov. Roy Cooper has ordered that $4 million be distributed to fund mosquito control efforts in counties currently under a major disaster declaration. Moore County, along with 26 other North Carolina counties, was part of that declaration. Following the governor's order, Moore County Government officials met with representatives from Moore County municipalities and determined that the county will not

Follow the $$$$!!!

CDC Supplemental Funding

- July 2016, CDC's Office of Public Health Preparedness and Response (OPHPR) **awarded $25 million** in supplemental funding to 53 jurisdictions (41 states, eight territories, and four metropolitan areas) to support Zika preparedness and response activities.
- December 2016, CDC awarded an **additional $25 million** to 21 of the 53 jurisdictions at the greatest risk for seeing Zika in their communities based on the presence of the mosquito responsible for spreading Zika, history of local transmission, or a high volume of travelers from Zika-affected areas.
- The additional $25 million was part of the $350 million in Zika supplemental funding provided to CDC by Congress in 2016.

CDC Supplemental Funding

- CDC awarded approx. **$97 million** to 58 state, territorial, city, and local public health departments through the Epidemiology and Laboratory Capacity for Infectious Diseases Cooperative Agreement;
- **$8 million** to 38 state, territorial, and local jurisdictions for Zika birth defects surveillance activities;
- **$40 million** to four universities to establish vectorborne disease regional centers of excellence; and
- **$14 million** to the Puerto Rico Science, Technology, and Research Trust to oversee the first vector control unit in Puerto Rico.

CDC Supplemental Funding

- Among the 53 jurisdictions, the percentage that reported having a Zika virus readiness, response, and recovery plan increased from 26% in June 2016 to 64% in July 2017.

- Overall, Zika planning and response activities increased among jurisdictions from June 2016 to July 2017.

SMASH Act: Strengthening Mosquito Abatement for Safety and Health Act

- This bill amends the Public Health Service Act to revise and extend through FY2023 Centers for Disease Control and Prevention (CDC) grants for mosquito control programs.
- The grant program is expanded so that grants may be used to address emerging, infectious mosquito-borne diseases and to improve existing control programs.
- The CDC must give preference to applicants that have: (1) a public health emergency due to a mosquito-borne disease, or (2) a control program that is consistent with existing state preparedness plans.

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115TH CONGRESS
1ST SESSION

H. R. 1310

To support programs for mosquito-borne and other vector-borne disease surveillance and control.

IN THE HOUSE OF REPRESENTATIVES

MARCH 2, 2017

Mr. SOTO (for himself, Mr. CURBELO of Florida, Ms. CASTOR of Florida, Mr. GAETZ, Mr. CRIST, Mrs. DEMINGS, Mr. DEUTCH, Ms. FRANKEL of Florida, Mr. HASTINGS, Mr. LAWSON of Florida, Mrs. MURPHY of Florida, Mr. PERLMUTTER, Ms. WASSERMAN SCHULTZ, and Ms. WILSON of Florida) introduced the following bill; which was referred to the Committee on Energy and Commerce

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A BILL

To support programs for mosquito-borne and other vector-borne disease surveillance and control.

SMASH Act: Strengthening Mosquito Abatement for Safety and Health Act

- This amounts to $130 million per year, FY 2018-FY 2023

- The requirement for matching funds may be waived if the area covered by a grant applicant has an extreme need due to the size or density of the human population, the size or density of the mosquito population, or the severity of the mosquito-borne disease.

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Example of Local Budgets for Vector Control

Marion County Healthcare Foundation helps county officials in mosquito spray control

- MARION, S.C. – Marion County officials received some relief to help the public being overwhelmed by large mosquitoes spawned by standing water as a result of Hurricane Florence.
- Marion County Healthcare Foundation donated a $**137,764** check to Marion County Council Thursday to fund mosquito control.
- **The county didn't have a mosquito control spray program due to lack of funding**. Only the city of Marion had a program through a private contractor and has been spraying every night since the storm.
- Harper called it a program that is going to benefit all of Marion County.
- "We got the equipment ordered and that should be here by the first of next week," he said. "We will begin spraying for mosquitoes by the end of next week."
- **Harper said the grant will allow county officials to purchase three Clarke Grizzly ULV mosquito spray units.**

Rockland County, NY

Type	Object	2016 Actual	2017 Actual	2018 Adopted	2019 Requested	2019 Proposed
Expense	Personnel Services	$422,971	$328,931	$326,080	$331,935	$328,935
Expense	Supplies	$95,062	$77,473	$97,800	$95,800	$95,800
Expense	Contractual Expenses	$1,645	$1,463	$8,600	$8,600	$8,600
DOH - Mosquito Control Pg	**Total Expenses**	**$519,678**	**$407,867**	**$432,480**	**$436,335**	**$433,335**
Revenue	Departmental Income	$115,349	$107,317	$122,790	$120,425	$120,425
Revenue	Fines & Forfeitures	$25,295	$17,650	$25,000	$25,000	$25,000
Revenue	State Revenue	$156,307	$195,717	$145,000	$175,000	$175,000
DOH - Mosquito Control Pg	**Total Revenues**	**$296,951**	**$320,684**	**$292,790**	**$320,425**	**$320,425**

Shelby County, TN
Mosquito and Rodent Control Program
Funding Strategy

- Introduction of a Vector Control State Bill
- 104th TN General Assembly approved legislation authorizing Shelby County to establish the Vector Control Fee to cover cost of operations on March 19, 2005.
- Shelby County Resolution on August 8, 2005, County Commission authorized a resolution to establish a **Vector Control Fee of $0.75 per month** on bills issued by MLG&W. Shelby County Mayor was authorized to enter into a contract with MLG&W to bill and collect fees as a designated item on its utility bill.
- Vector Control Fee effective date: October 1, 2005
- The fee will not relieve property owners (commercial and residential) of their obligation to maintain vermin-free properties.

New Orleans Mosquito Control District

- FY18
- Mosquito & Rodent Control Fund
  - Revenue: $3,515,000
  - Usage of Funds $3,908,262

2010	2011	2012	2013	2014	2015	2016	2017	2018
2.483M	2.377M	2.832M	2.225M	2.723M	2.715M	3.562M	3.183M	3.678M
FTEs from 33 to 26 in the same time frame								

Lee County FL Mosquito Control District

- Oct 17 – Dec 18
- The district has 14 helicopters and 5 planes.

- Mosquito & Rodent Control Fund
  - Total Expenditures and Balances: $29,684,600
  - Reserves $ 4,637,305

Lee County has vast areas of breeding grounds, including 52,000 acres of salt marsh, equivalent to seven counties on the east coast.

So What is the Value of Public Investment in Vector Control?

- Public investment by federal, state, and local governments builds the nation's capital stock by devoting resources to
  - the basic physical infrastructure,
  - innovative activity,
  - green investments, and
  - education (both primary and advanced, as well as job training)

- leads to higher productivity and/or higher living standards.

Public Investment in Vector Control

- Examples of Innovation and Disparity
- Areas in dire need of improvement and support
- Community Engagement paramount
- Benefits of Public Private Partnerships
  - Commercial
  - Academia

- WHO released the draft Global Vector Control Response 2017–2030 (GVCR), which provides strategic guidance to countries and development partners in strengthening their vector control measures.


Teamwork
Trust
Inspiration
Share
COLLABORATION
Exchange
Success
Support
Assist