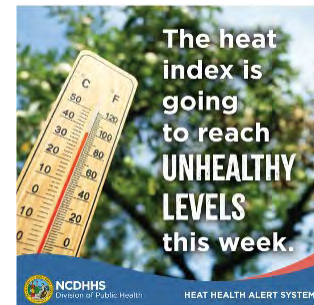# NCDHHS 2024 HEAT HEALTH ALERT SYSTEM EVALUATION SUMMARY REPORT
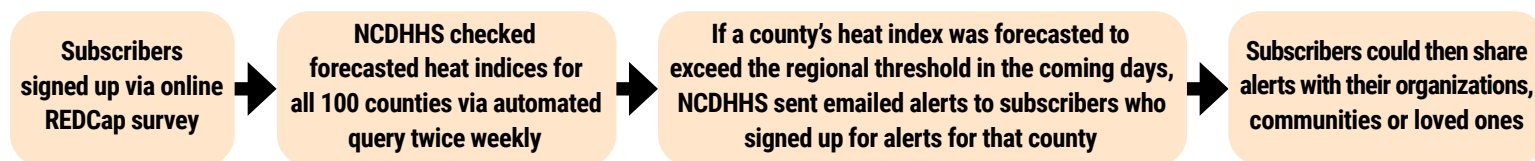
BACKGROUND

The NCDHHS Climate and Health Program operates a heat health alert system (HHAS) each year from May 1-September 30 to provide advance notice when local heat indices are forecast to reach unhealthy levels. We began piloting this system in 2018 in a subset of counties in eastern North Carolina with the support of partners from local health departments, emergency management, and community-based organizations. We enhanced the HHAS in 2023 with new thresholds based on historical climate data and standardized message templates to help partners distribute alerts. We began checking forecasts and notifying our partners when the threshold was forecasted to be reached.

In 2024, we expanded the heat health alert system statewide by automating the process for checking the forecast, adopting new regional health-based heat index thresholds, and opening registration to anyone who wanted to receive emailed alerts. Users signed up for alerts via an online survey and were assigned to one or more regional listservs based on the county/counties for which they registered. When the heat index was forecasted to exceed the threshold in a region, we sent emailed heat alerts to users who signed up for that region. We developed a new communications toolkit and included it in alert emails to assist in further distribution of alerts. In the fall of 2024, we conducted a process evaluation of the statewide heat health alert system using data collected at point of registration as well as internal data to assess reach and effectiveness of implementation. Results of this evaluation are presented here.
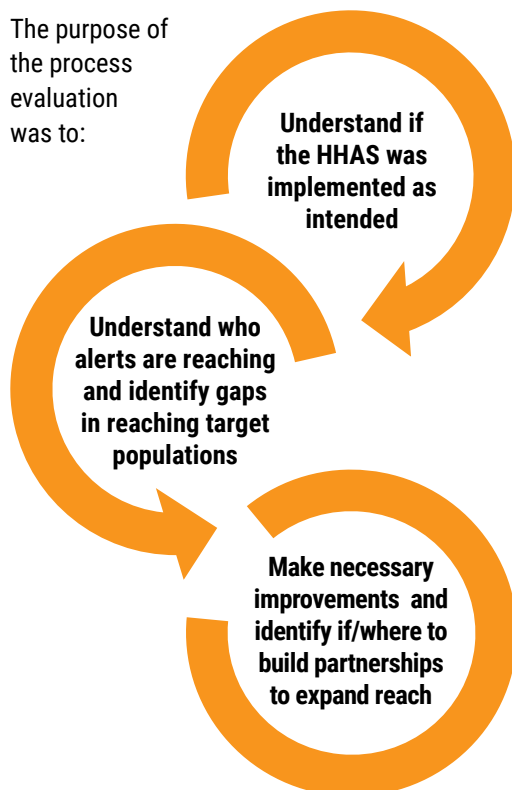

The heat index is going to reach UNHEALTHY LEVELS this week.

NCDHHS Division of Public Health — HEAT HEALTH ALERT SYSTEM

2024 Heat Health Alert System Process

Subscribers signed up via online REDCap survey	NCDHHS checked forecasted heat indices for all 100 counties via automated query twice weekly	If a county's heat index was forecasted to exceed the regional threshold in the coming days, NCDHHS sent emailed alerts to subscribers who signed up for alerts for that county	Subscribers could then share alerts with their organizations, communities or loved ones

EVALUATION PURPOSE AND METHODS

The purpose of the process evaluation was to:

- Understand if the HHAS was implemented as intended
- Understand who alerts are reaching and identify gaps in reaching target populations
- Make necessary improvements and identify if/where to build partnerships to expand reach

We wanted to know...	To measure we used…
Did we send out alerts when the threshold was exceeded? What proportion of days during the heat season when threshold(s) were exceeded did we succeed in sending out alerts? We defined a success as sending alerts to at least 95% of counties that exceeded their threshold on that day.	**NCDHHS Heat Alert Distribution log** • Date forecast was checked • Alert sent (Yes/No)
Who did our heat alerts reach and did we reach populations disproportionately impacted by extreme heat?	**Registration survey** • Populations user indicated they belonged to • Populations user worked with and whether they planned to distribute alerts to these populations
Which of our 7 NC DETECT regions did our alerts reach?	**Registration survey** • County/counties the user signed up for • HHAS Listserv management organized counties by NC DETECT region
Which sectors/organizations did our alerts reach?	**Registration survey** • Sector(s) or organization type(s) user indicated they worked in
For what purposes are the heat alerts used?	**Registration survey** • Planned use(s) for heat alerts

RESULTS

ALERT DISTRIBUTION

50 days in the 2024 heat season where the heat index threshold was exceeded out of 152 possible days

→ **1,241** county-level alerts were sent

→ **NCDHHS was 100% successful in sending alerts when thresholds were exceeded**

HEAT HEALTH ALERT SYSTEM REGISTRATION SURVEY

579 Total Subscribers

- 564 English language subscribers
- 14 Spanish language subscribers
- 1 English and Spanish language subscriber

Demographics of subscribers
- 65% of subscribers belonged to a vulnerable population
- Most subscribers reported living in a rural area (23%), urban area (16.9%), or were a racial or ethnic minority (13.5%)
- Fewer subscribers were currently experiencing homelessness (0.3%), lacked reliable transportation (1%), or indicated English was NOT their first language (1.2%)

Populations subscribers worked or volunteered with
- 94.5% of subscribers worked with or served 1 or more vulnerable populations
- Most subscribers worked with racial or ethnic minorities (40.1%), older adults (35.8%) or children under 5 (35.8%)
- Fewer subscribers worked with urban residents (21.8%) or other outdoor workers (22.6%)

Populations receiving alerts
- 83% of subscribers reported:
    - They work with a population disproportionately impacted by heat and planned to share alerts with these populations, or
    - They personally belong to a population that is disproportionately impacted by heat

Regions reached
- Alerts reached all 7 NC DETECT regions
- Subscribers most registered for the following NC DETECT regions:
    - Region 4 (RTP Area, including Randolph, Guilford, and Caswell Counties) (38.7%)
    - Region 2 (Southeastern NC) (29%)
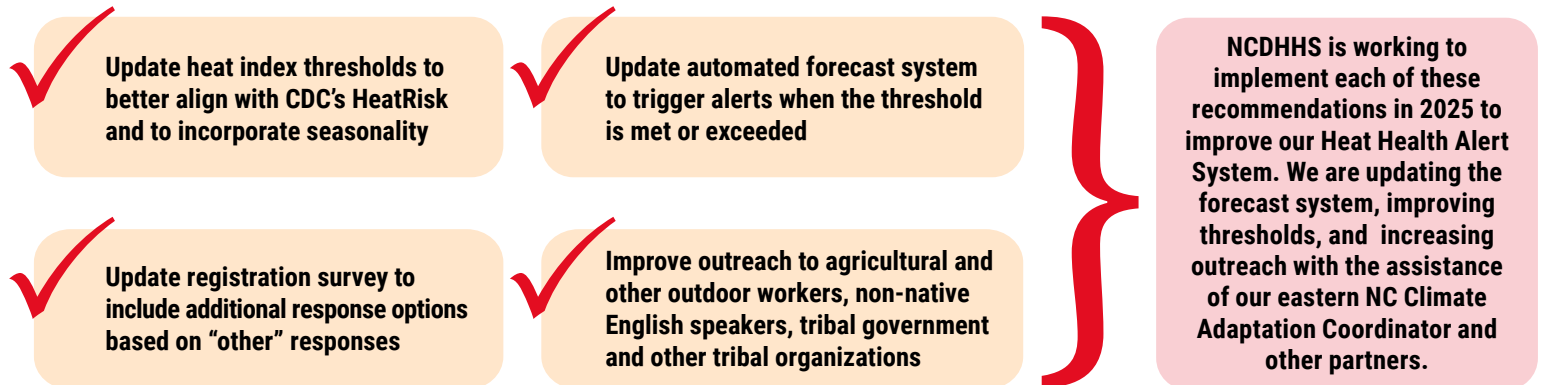   - Region 5 (Triad Area) (24.7%)

Sectors/types of organizations reached
- 19 sectors and organization types reached
- Most subscribers worked for a local health department (34.9%), state government (13.6%), or health care (11.2%)
- Fewer subscribers worked for tribal government (1%) or other tribal serving organizations (0.5%)

Planned use for alerts
- Most subscribers planned to share alerts with populations they worked with or served (73.1%)
- Subscribers also planned to use alerts to protect themself or immediate family members (65.3%), or for situational awareness or decision making at their job or volunteer service (62.2%)
- Three subscribers (0.52%) planned to use alerts for research or scientific purposes

RECOMMENDATIONS FOR IMPROVEMENT

✓ Update heat index thresholds to better align with CDC's HeatRisk and to incorporate seasonality

✓ Update automated forecast system to trigger alerts when the threshold is met or exceeded

✓ Update registration survey to include additional response options based on "other" responses

✓ Improve outreach to agricultural and other outdoor workers, non-native English speakers, tribal government and other tribal organizations

} **NCDHHS is working to implement each of these recommendations in 2025 to improve our Heat Health Alert System. We are updating the forecast system, improving thresholds, and increasing outreach with the assistance of our eastern NC Climate Adaptation Coordinator and other partners.**

APPENDIX

Figure 1. 2024 Heat Health Alert System Regions

NC DETECT Regions

- 1 - Northeastern NC
- 2 - Southeastern NC
- 3 - Fayetteville Area
- 4 - RTP Area
- 5 - Triad Area
- 6 - Western NC
- 7 - Charlotte Area

Table 1. Characteristics of HHAS subscribers (n=579)

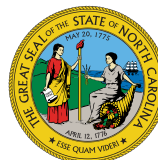| Characteristics of HHAS subscribers	N (%)
Regions subscribers registered for*	
Region 1 (Northeastern NC)	120 (20.7%)
Region 2 (Southeastern NC)	168 (29.0%)
Region 3 (Fayetteville area +Montgomery)	135 (23.3%)
Region 4 (RTP area +Randolph, Guilford, Caswell)	224 (38.7%)
Region 5 (Triad)	143 (24.7%)
Region 6 (Western NC)	118 (20.4%)
Region 7 (Charlotte area)	120 (20.7%)
Sectors/organization types subscribers work for*	
Local Health Department	202 (34.9%)
County government	60 (10.4%)
Emergency Management	36 (6.2%)
Municipal government	11 (1.9%)
Tribal government	6 (1.0%)
Other tribal-serving organization	3 (0.5%)
State government	79 (13.6%)
Federal government	10 (1.7%)
Health care (including clinicians, community health workers, clinic staff)	65 (11.2%)
Faith-based organization	13 (2.2%)
Nonprofit community-based organization	51 (8.8%)
Private for-profit organization	17 (2.9%)
Parks and Recreation or other athletic department	7 (1.2%)
Education (K-12)	46 (7.9%)
Research institution	21 (3.6%)
Other†	22 (3.8%)
None of the above	36 (6.2%)
Populations subscribers work/volunteer with*	
Any vulnerable population	547 (94.5%)
Mobile home residents	163 (28.2%)
Older adults (65 or older)	207 (35.8%)
Racial or ethnic minorities	232 (40.1%)
People experiencing homelessness	169 (29.2%)
Children under 5 years old	207 (35.8%)
Youth aged 5-18 years	226 (39.0%)
Low-income residents or people who cannot afford their energy bills	194 (33.5%)
People who do not have access to central air conditioning at home	169 (29.2%)
People who do not have access to reliable transportation	194 (33.5%)
People who live alone	152 (26.3%)
Farmworkers or other agricultural workers	158 (27.3%)
Other outdoor workers	131 (22.6%)
Non-native English speakers	173 (29.9%)

Rural residents	193 (33.3%)
Urban residents	126 (21.8%)
Other‡	25 (4.3%)
Subscriber does not conduct outreach or serve any of these groups	153 (26.4%)
Populations subscribers belong to*	
Any vulnerable population	378 (65.3%)
I live in a mobile home	36 (6.2%)
I am over 65 years of age	46 (7.9%)
I am a racial or ethnic minority	78 (13.5%)
I am currently experiencing homelessness	2 (0.3%)
I take care of someone under age 5	50 (8.6%)
I or my household members cannot afford our energy bill	14 (2.4%)
I do not have access to reliable transportation	6 (1.0%)
I do not have access to central air conditioning at home	13 (2.2%)
I live alone	47 (8.1%)
I work in agriculture	14 (2.4%)
I work outside	38 (6.6%)
English is not my first language	7 (1.2%)
I live in a rural area	133 (23.0%)
I live in an urban area	98 (16.9%)
None of the above	147 (25.4%)
Prefer not to answer	49 (8.5%)
Planned use for heat alerts*	
Share with populations I work with or serve	423 (73.1%)
Protect myself or my immediate family members	378 (65.3%)
For situational awareness or decision making at my job or volunteer service	360 (62.2%)
Other§	3 (0.52%)

* Percentages do not total to 100% because survey participant could select more than one response.

† Other sectors/organization types included Agriculture (n=2), Childcare (n=6), Community member (n=9), Higher education (n=2), Journalism (n=3).

‡ Other populations included People with disabilities (n=3), People with health conditions (n=2), People who are incarcerated (n=1), Outdoor recreation (n=1), Historically underrepresented communities (n=1).

§ Other planned uses included Academic/scientific purposes (n=3).

NC DEPARTMENT OF
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Division of Public Health

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