

# Progress Review Webinar: Hearing and Other Sensory or Communication Disorders and Vision

February 22, 2018



Office of Disease Prevention  
and Health Promotion

# The Diagnosis, Prevention, and Treatment of Sensory and Communication Disorders

Don Wright, MD, MPH

Deputy Assistant Secretary for Health

Health Promotion and Disease Prevention

U.S. Department of Health and Human Services



Office of Disease Prevention  
and Health Promotion

## Chair

- Don Wright, MD, MPH, Deputy Assistant Secretary for Health, Disease Prevention and Health Promotion, U.S. Department of Health and Human Services

## Presentations

- Charles Rothwell, MBA, MS, Director, National Center for Health Statistics
- James F. Battey, Jr., MD, PhD, Director, National Institute on Deafness and Other Communication Disorders, National Institutes of Health
- Paul Sieving, MD, PhD, Director, National Eye Institute, National Institutes of Health

## Community Highlight

- Nicole Marrone, PhD, CCC-A, Department of Speech, Language and Hearing Sciences, University of Arizona

# Healthy People at the Forefront of Public Health

Healthy People  
2020

HEALTHY PEOPLE  
The Surgeon General's Report On  
Health Promotion And Disease Prevention



1979



1990



2000



2010



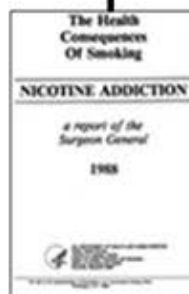
1979  
Smallpox  
Eradicated



1970 Clean  
Air Act



1982 AIDS is  
Infectious



1988 SG  
Declares  
Nicotine  
Addictive



1990  
Human  
Genome  
Project  
Begins



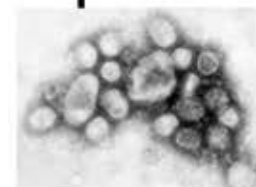
1990s Drinking  
Water Fluoridation



2000s Obesity  
and Chronic Disease



September  
11, 2001







2009 H1N1 Flu



2005 Hurricane  
Katrina

# Evolution of Healthy People

Healthy People  
2020

Target Year	1990	2000	2010	2020
				
Overarching Goals	<ul style="list-style-type: none"> <li>• Decrease mortality: infants–adults</li> <li>• Increase independence among older adults</li> </ul>	<ul style="list-style-type: none"> <li>• Increase span of healthy life</li> <li>• Reduce health disparities</li> <li>• Achieve access to preventive services for all</li> </ul>	<ul style="list-style-type: none"> <li>• Increase quality and years of healthy life</li> <li>• Eliminate health disparities</li> </ul>	<ul style="list-style-type: none"> <li>• Attain high-quality, longer lives free of preventable disease</li> <li>• Achieve health equity; eliminate disparities</li> <li>• Create social and physical environments that promote good health</li> <li>• Promote quality of life, healthy development, healthy behaviors across life stages</li> </ul>
# Topic Areas	15	22	28	42
# Objectives/Measures	226	312	1,000	~1,200



# The Public Health Importance of Human Communication

- **Communication Disorders** cross all ethnic and socioeconomic lines, and reduce our ability to interact with each other. They can lead to social isolation and difficulty at school or work. At least 20% of U.S. adults have significant impairment of hearing, balance, taste, smell, voice, speech, or language.
- **Newborn Hearing Screening** helps identify hearing problems early, to enable language intervention if needed. Children begin to learn speech and language in the first six months of life.
- **Hearing Aid Use** can be critical to help some adults with hearing loss maintain their ability to communicate. Despite this, most adults who could benefit from hearing aids do not use them, often because the devices are not accessible or they are too costly.

# The Public Health Importance of Human Communication

Healthy People  
2020

- **Noise-Induced Hearing Loss** – Loud sounds can damage the inner ear, resulting in permanent hearing loss. Many people don't realize that every day activities can damage hearing just as much as noise on the job.
- **Tinnitus** is the #1 disability for military veterans. Tinnitus is ringing, roaring, buzzing, or other sound in the ears or head when no external sound is present.
- **Balance and Dizziness** problems can cause falls. Falls are the leading cause of injury and death in older Americans, according to the CDC.
- **Chemosensory (Taste & Smell) Disorders** – We need our sense of taste and smell to detect poisonous fumes and spoiled food. Taste and smell disorders can also lead to unhealthy eating habits and poor nutrition.

Source: <https://www.cdc.gov/media/releases/2016/p0922-older-adult-falls.html>



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# Causes of Vision Loss/Blindness

Healthy People  
2020

**Leading causes of vision loss and blindness are age-related eye diseases**

**Age-related Macular Degeneration**—blurs sharp, central vision needed for straight-ahead activities like reading and driving

**Cataract**—clouding of the lens of the eye

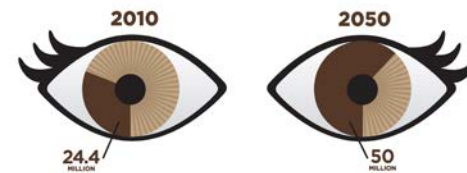
**Diabetic Retinopathy**—diabetes complication that affects small blood vessels in the eye

**Glaucoma**—damages the optic nerve which carries vision messages from the eye to brain

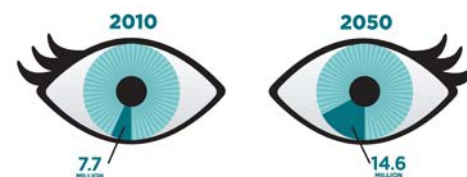
AGE-RELATED MACULAR DEGENERATION



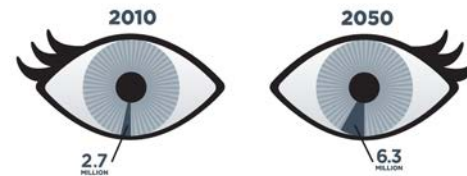
CATARACT



DIABETIC RETINOPATHY



GLAUCOMA



NOTES: <https://www.nei.nih.gov>



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Each eye represents 80 million people,  
the estimated number of Americans  
aged 65 and over in 2050



# Burden of Vision Impairment

**U.S. Burden**    3.22 million people over age 40 with **vision loss**  
1.02 million people are **blind**  
\$139 billion, **total costs and lost productivity**

***Correctable vision impairment*** includes

- **Cataract**, lens replacement surgery to restore good vision
- **Refractive Errors**, (e.g., nearsightedness), corrected by eyeglasses, contact lenses, or laser surgery (e.g., LASIK)
  - Uncorrected refractive error impairs vision in 8.2 million people

***Uncorrectable vision impairment*** from eye disease or trauma

- **Prevention and Therapies** can reduce vision loss if caught early

**Eye Care:** Only half of the estimated 61 million adults in the United States at high risk for serious vision loss visited an eye doctor last year

NOTES: <https://www.nei.nih.gov/eyedata/> ; <https://www.cdc.gov/visionhealth/basics/index.html>

Charles Rothwell, MBA, MS  
Director, National Center for Health Statistics  
Centers for Disease Control and Prevention



# Presentation Overview



- Tracking the Nation's Progress
- Hearing and Other Sensory or Communication Disorders
- Vision

## ■ 27 HP2020 Measurable Hearing and Other Sensory or Communication Disorders Objectives:

- 7 Target met
- 3 Improving
- 9 Little or no detectable change
- 2 Getting worse
- 6 Baseline data only

## ■ 14 HP2020 Measurable Vision Objectives:

- 6 Target met
- 1 Improving
- 6 Little or no detectable change
- 1 Baseline data only

NOTES: The Hearing and Other Sensory or Communication Disorders Topic Area has 9 developmental objectives. The Vision Topic Area has 1 developmental objective. Measurable objectives are defined as having at least one data point currently available, or a baseline, and anticipate additional data points throughout the decade to track progress. The developmental objectives do not have a national baseline value.

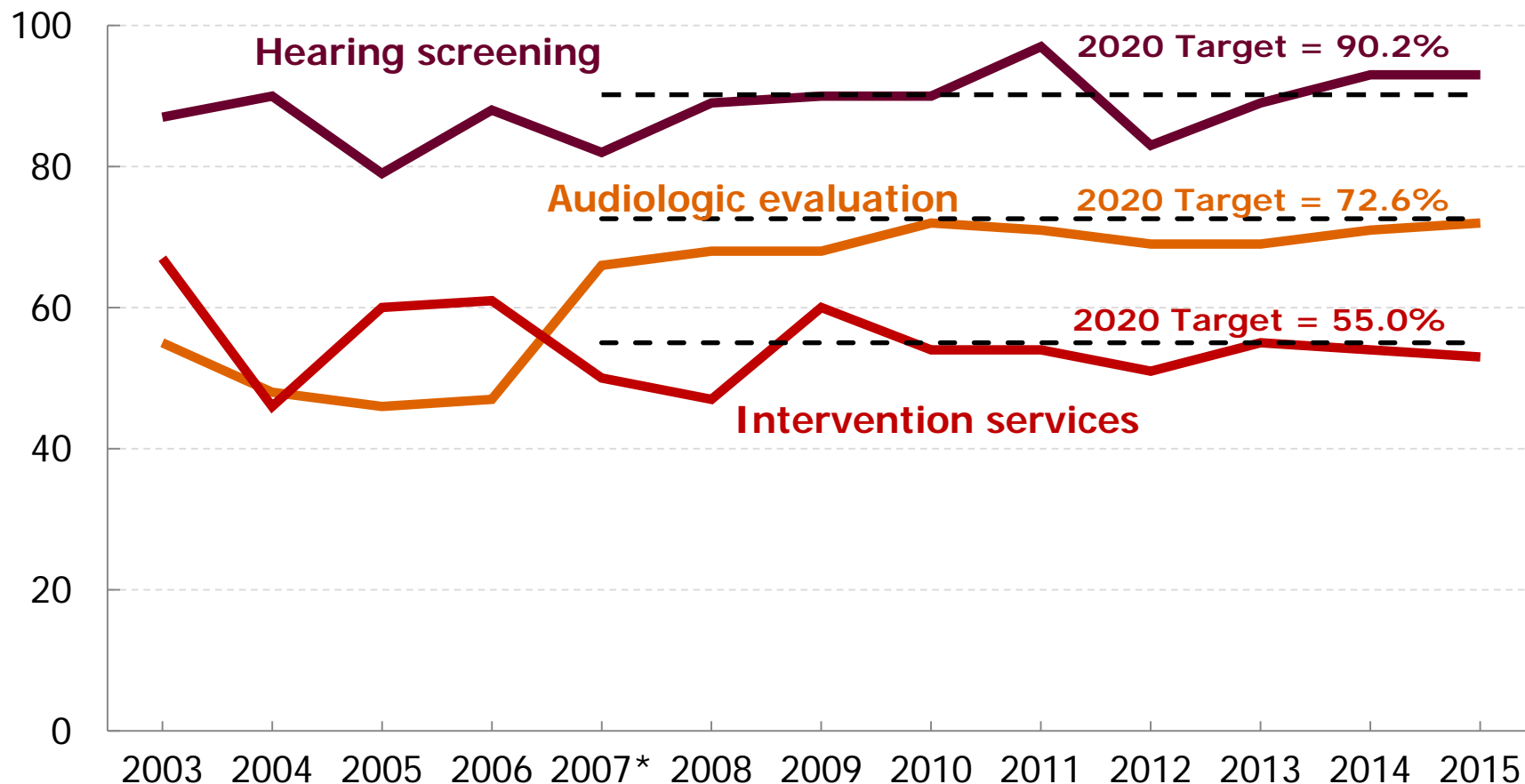
- Tracking the Nation's Progress
- Hearing and Other Sensory or Communication Disorders
  - Newborn screening, evaluation, and intervention services
  - Noise-induced hearing loss
  - Referral to audiologist or otolaryngologist due to tinnitus
  - Falls caused by dizziness or imbalance
  - Visits to healthcare providers by adults with chemosensory disorders
- Vision



# Newborn Hearing Screening, Evaluation, and Intervention

Healthy People  
2020

Percent



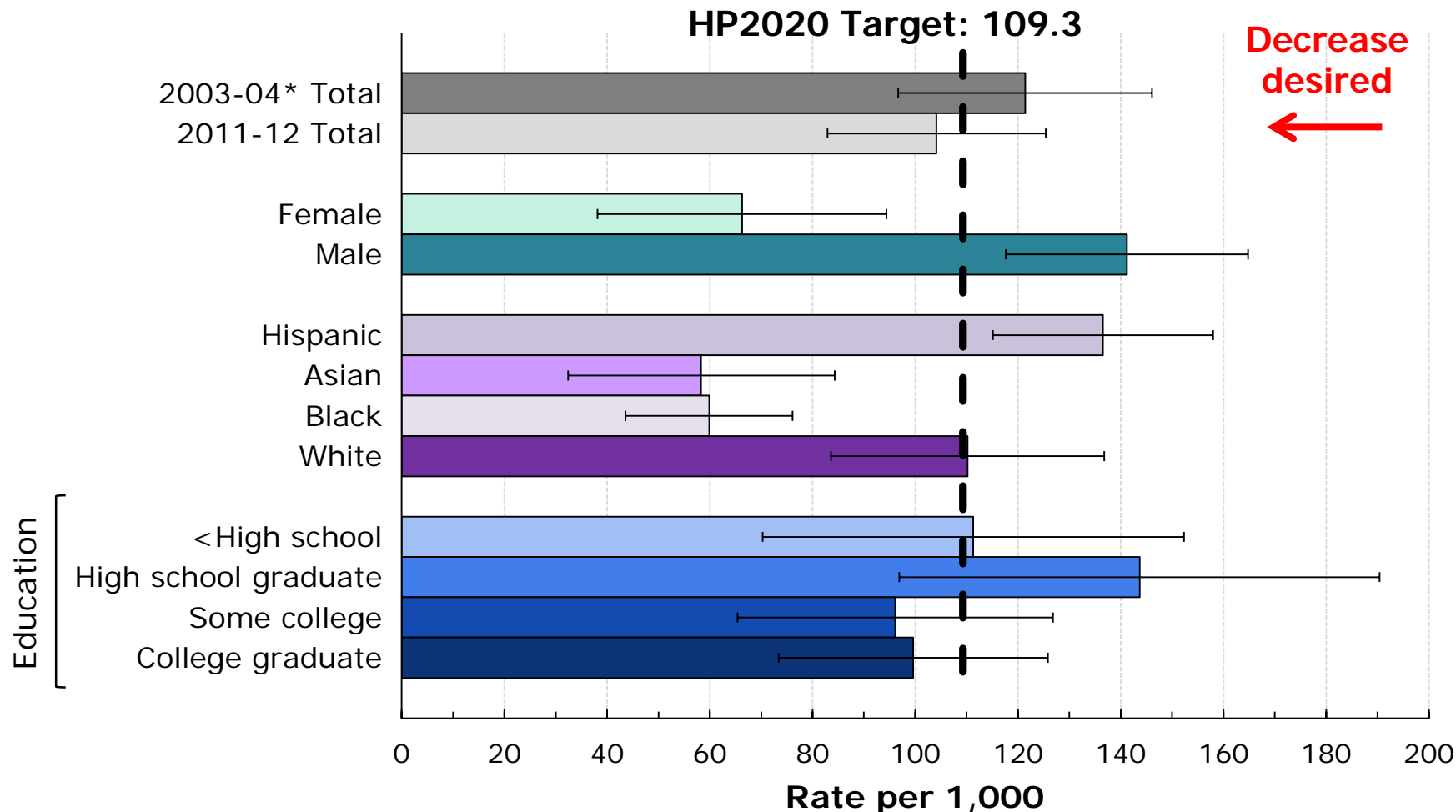
NOTES: 2007\* = HP2020 baseline. Hearing screening data are for newborns aged 1 month and under who had screening for hearing loss; audiologic evaluation data are for infants aged 3 months and under who did not pass the hearing screening and received audiologic evaluation; intervention services data – for infants aged 6 months and under with confirmed hearing loss enrolled for intervention services.

SOURCE: State-based Early Hearing Detection and Intervention Program Network (EHDI), CDC/NCBDDD.

**Objs. ENT-VSL-1.1  
through 1.3  
Increase desired**

# Noise-Induced Hearing Loss, Adults 20-69 Years, 2011-12

Healthy People  
2020

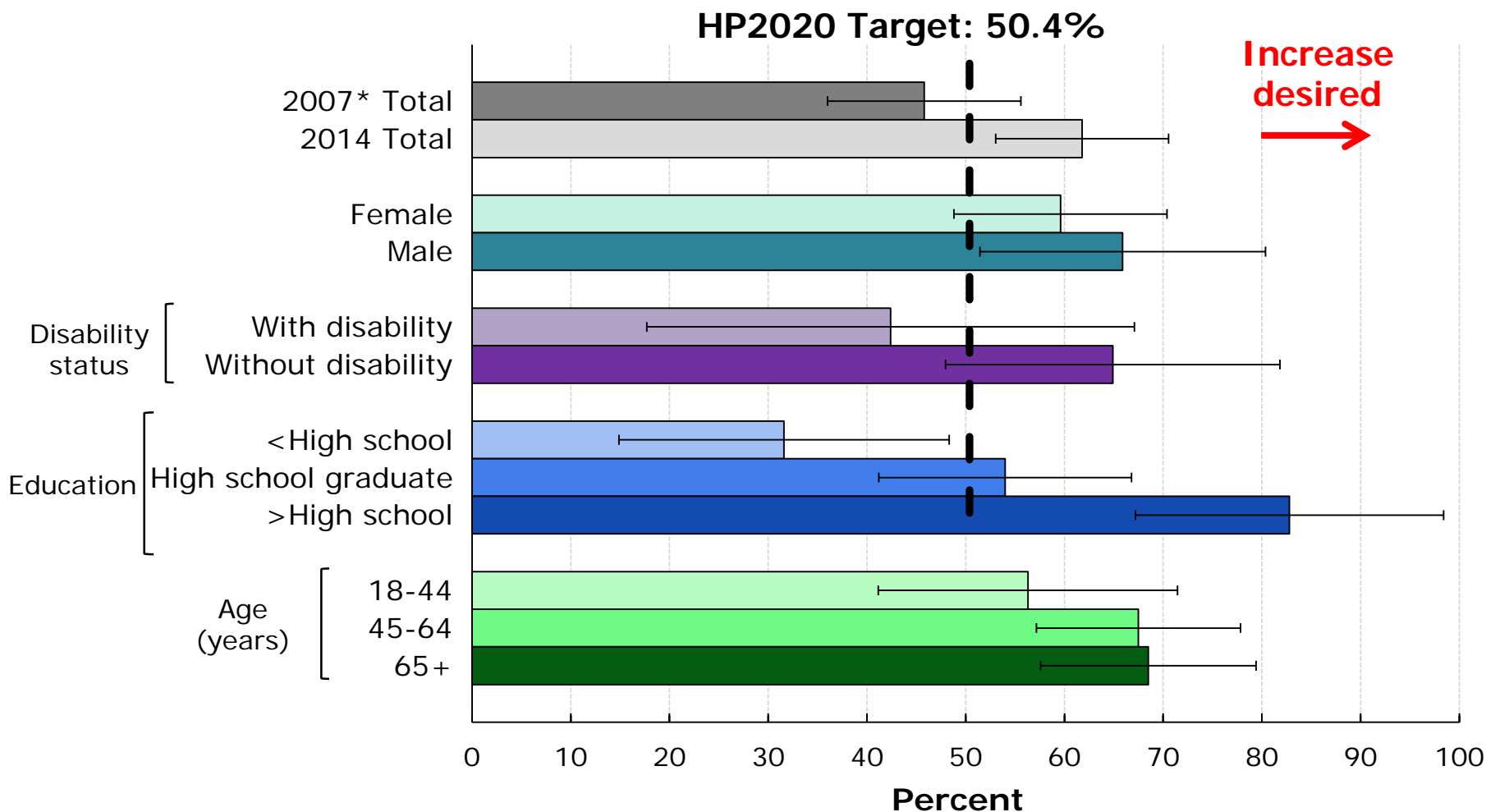


NOTES: — = 95% confidence interval. 2003-04\* = HP2020 baseline. Except for education, data are for adults aged 20 to 69 years who had elevated hearing thresholds, or audiometric notches, in high frequencies (3, 4, or 6 kHz) in both ears, signifying noise-induced hearing loss. The categories Asian, black, and white exclude persons of Hispanic origin. Persons of Hispanic origin may be any race. Respondents were asked to select one or more races. Data for the single race categories are for persons who reported only one racial group. Educational attainment data are for adults aged 25-69 years. Data are age-adjusted to the 2000 standard population. SOURCE: National Health and Nutrition Examination Survey (NHANES), CDC/NCHS.

ENT-VSL-8

# Referrals to Specialists, Adults with Tinnitus, 2014

Healthy People  
2020

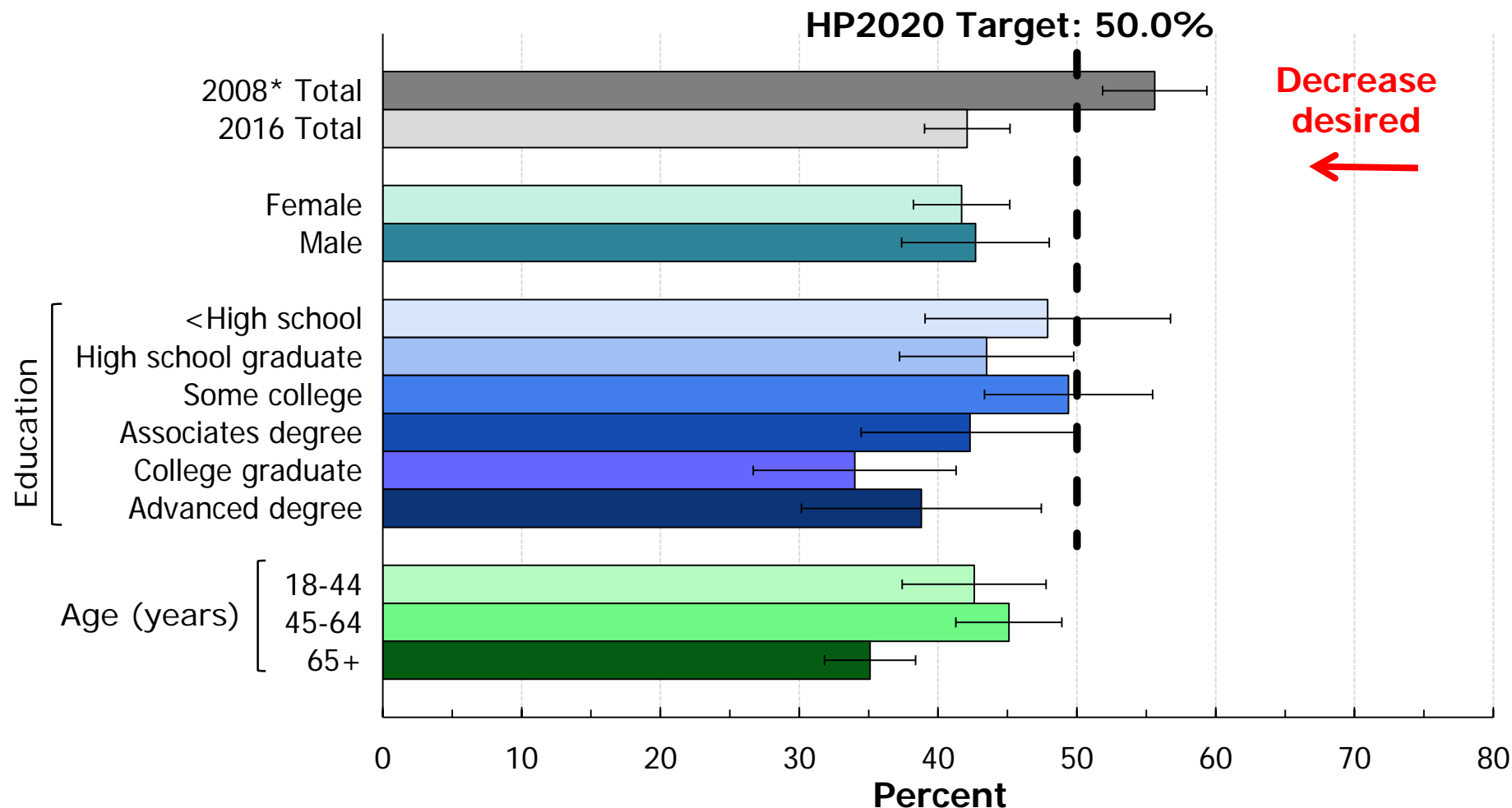


NOTES: — = 95% confidence interval. 2007\* = HP2020 baseline. Except for education, data are for adults aged 18 years and over bothered by the onset of tinnitus in the past 5 years and for whom it is a moderate, big, or very big problem, and who had been seen or been referred to an audiologist or otolaryngologist. Educational attainment data are for adults aged 25 and over. Except for age-specific estimates, data are age-adjusted to the 2000 standard population. Target is not applicable to age groups.

**ENT-VSL-9.2**

SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

# Falls Due to Dizziness, Vertigo, or Imbalance, Adults with Balance and Dizziness Problems, 2016



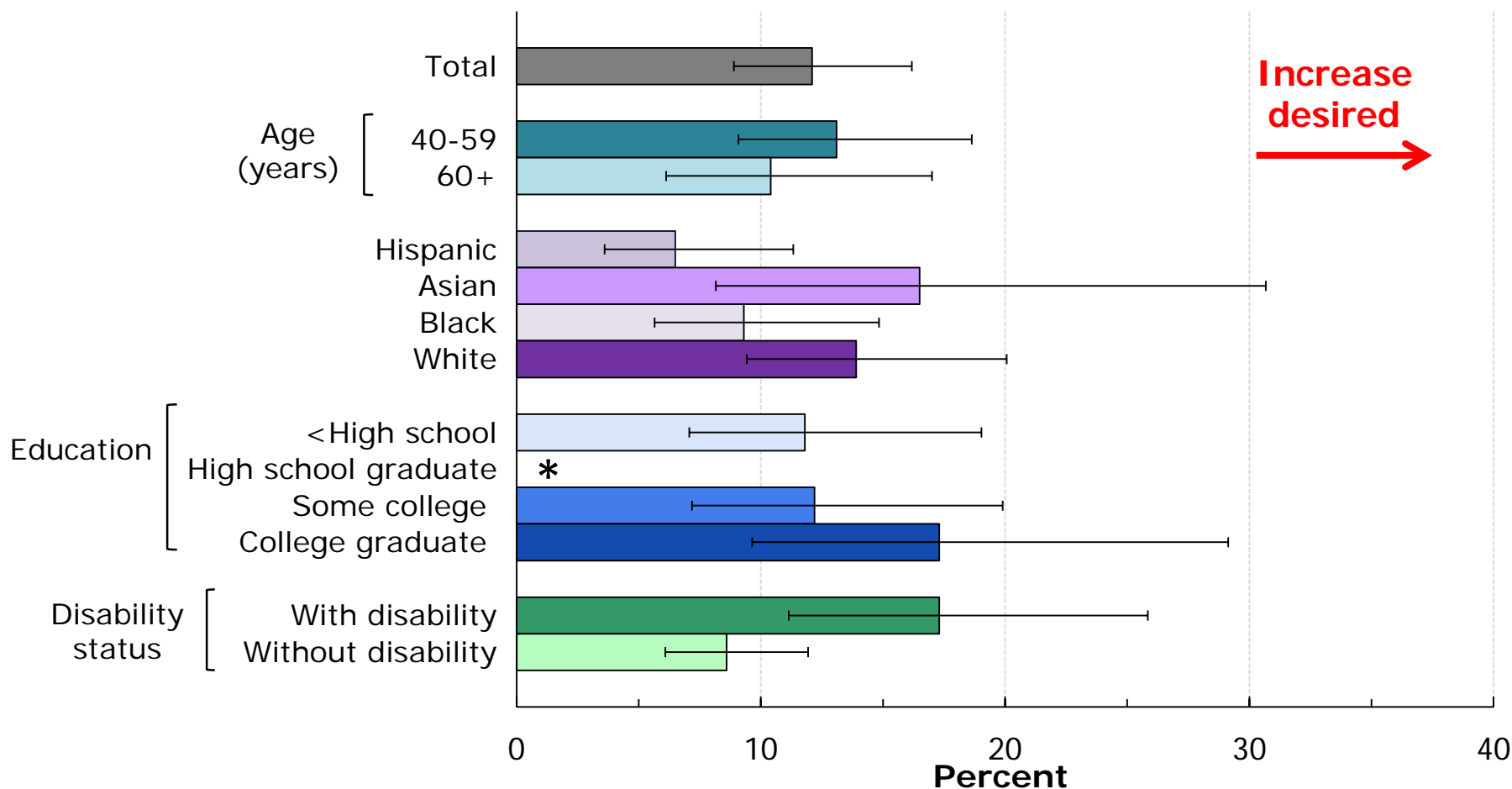
NOTES: — = 95% confidence interval. 2008\* = HP2020 baseline. Except for education, data are for adults aged 18 years and over with dizziness or balance problems who have fallen in the past 5 years while having dizziness, vertigo, or imbalance just before or around the time they fell. Educational attainment data are for adults aged 25 and over. Data, except for age groups, are age-adjusted to the 2000 standard population. Target is not applicable to age groups.

SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

Obj. ENT-VSL-15.1

# Healthcare Provider Visit, Adults 40+ Years with Smell or Taste Disorders, 2013–14

Healthy People  
2020



NOTES: — = 95% confidence interval. \*Data are not statistically reliable. Data are for adults aged 40 years and older who had smell or taste disorders and who had discussed their problem with a healthcare provider in the past 12 months. The categories Asian, black, and white exclude persons of Hispanic origin. Persons of Hispanic origin may be any race. Respondents were asked to select one or more races. Data for the single race categories are for persons who reported only one racial group. Except for age-specific groups, data are age-adjusted to the 2000 standard population.

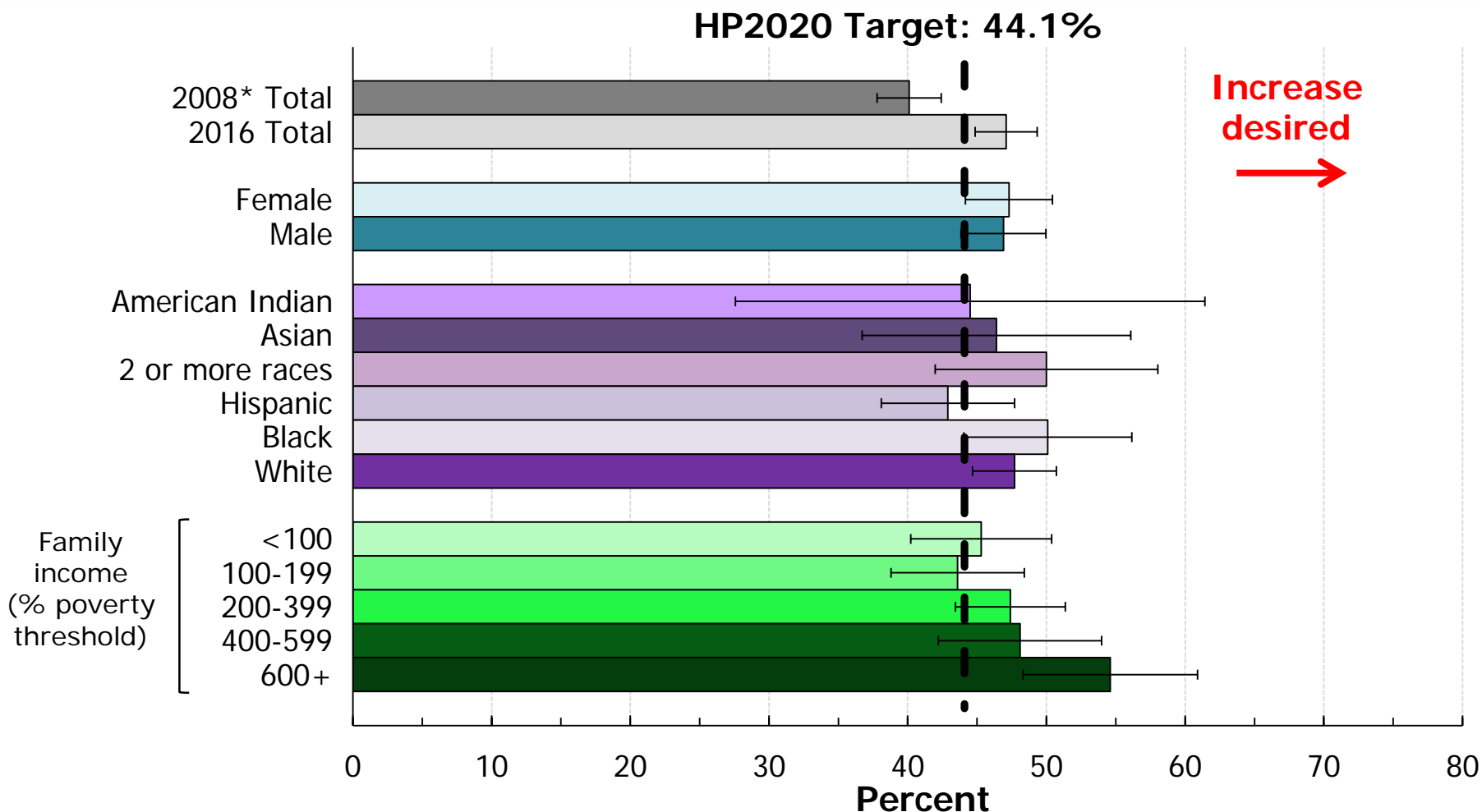
SOURCE: National Health and Nutrition Examination Survey (NHANES), CDC/NCHS.



- Tracking the Nation's Progress
- Hearing and Other Sensory or Communication Disorders
- Vision
  - Vision screening and eye examination
  - Visual impairment
  - Rehabilitation services and adaptive devices use by adults with visual impairment
  - Occupational eye injuries
  - Use of protective eyewear

# Vision Screening, Children 5 Years and Under, 2016

Healthy People  
2020

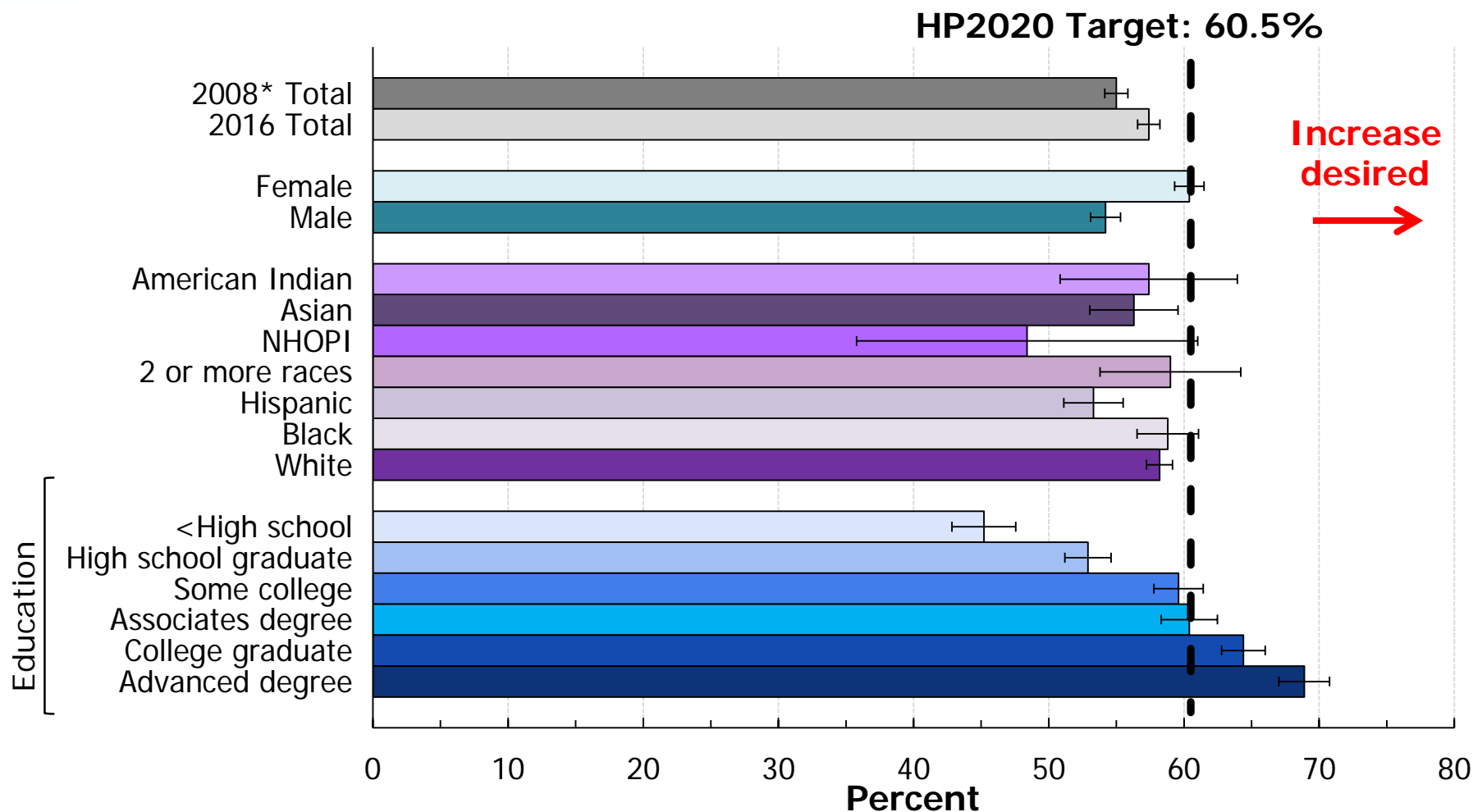


NOTES: — = 95% confidence interval. 2008\* Total = HP2020 baseline. Data are for children aged 5 years and under who have ever had their vision tested by a doctor or other health professional. American Indian includes Alaska Native. Black and white exclude persons of Hispanic origin. Persons of Hispanic origin may be any race. Respondents were asked to select one or more races. Data for the single race categories are for persons who reported only one racial group.

Obj. V-1

# Dilated Eye Examination in the Past 2 Years, Adults 18+ Years, 2016

Healthy People  
2020

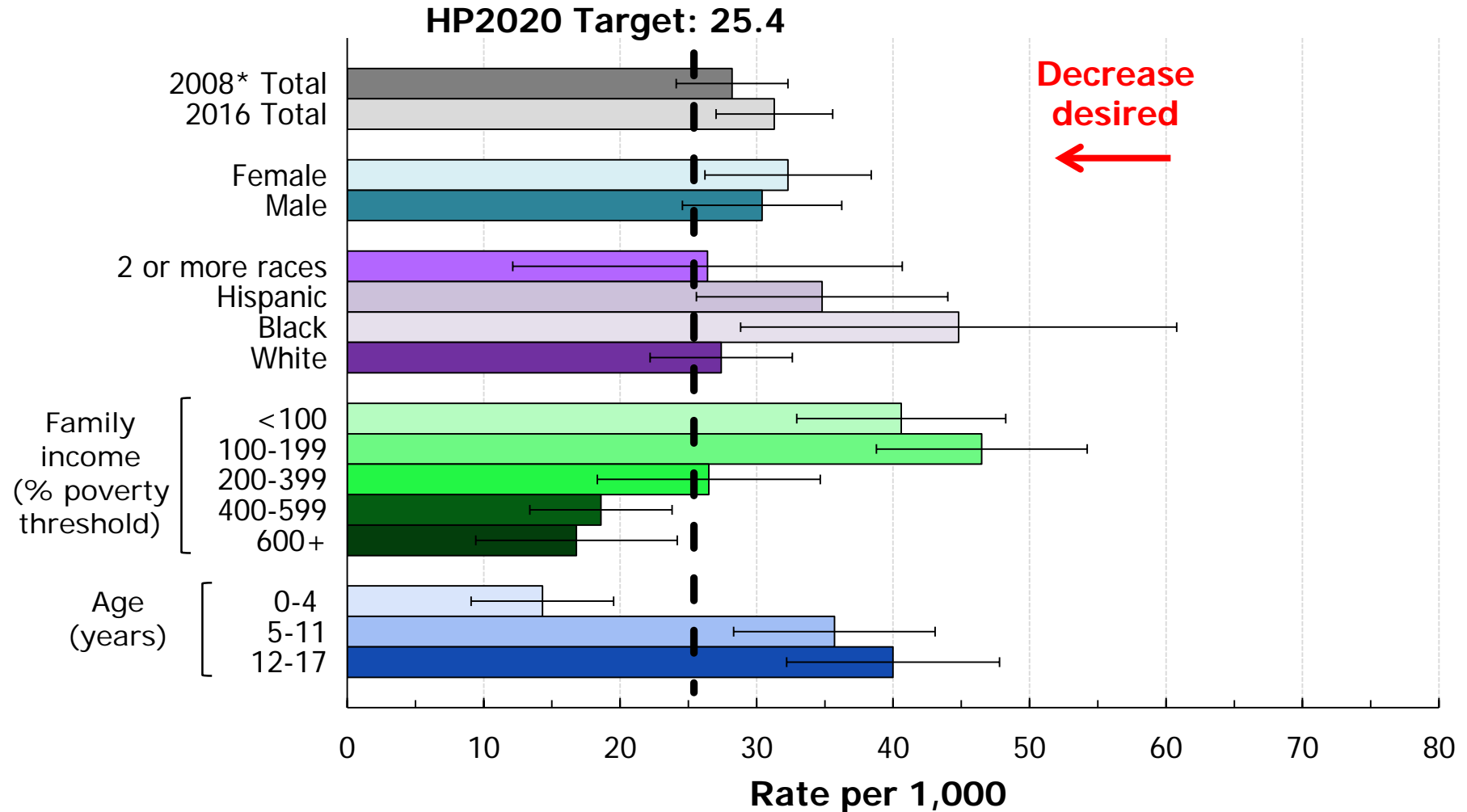


NOTES: — = 95% confidence interval. 2008\* Total = HP2020 baseline. Except for education, data are for adults 18 years and over, who report they had a dilated eye exam within the past two years. American Indian includes Alaska Native. NHOPI is Native Hawaiian or other Pacific Islander. Black and white exclude persons of Hispanic origin. Persons of Hispanic origin may be any race. Respondents were asked to select one or more races. Data for the single race categories are for persons who reported only one racial group. Educational attainment data are for adults aged 25 and over. Data are age-adjusted to the 2000 standard population. SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

Obj. V-4

# Visual Impairment and Blindness, Children 17 Years and Under, 2016

Healthy People  
2020



NOTES: — = 95% confidence interval. 2008\* Total = HP2020 baseline. Data are for children aged 17 years and under who have trouble seeing even when wearing glasses or contact lenses or were blind. Black and white exclude persons of Hispanic origin. Persons of Hispanic origin may be any race. Respondents were asked to select one or more races. Data for the single race categories are for persons who reported only one racial group.

**Obj. V-2**

SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

# Self-Reported Visual Impairment, Adults with Diagnosed Eye Diseases

Healthy People  
2020

Rate per 1,000

2008

2016

Decrease  
desired

HP2020 Target: 99.0

HP2020 Target: 30.8

HP2020 Target: 12.5

HP2020 Target: 14.0

Diabetic retinopathy

Glaucoma

Macular degeneration

Cataract

Age (years): 18+

45+

65+

NOTES: I = 95% confidence interval. Data are for adults aged 18 years and over who have ever been told by a doctor or healthcare professional that they had diabetic retinopathy; persons aged 45 years and over who have ever been told they had glaucoma or macular degeneration; and persons aged 65 years and over who have ever been told they had cataract, and reported vision loss due to these conditions. Data, except estimates for adults with diagnosed cataract, are age-adjusted to the 2000 standard population.

SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

Objs. V-5.2  
through 5.5



# Vision Rehabilitation Services, Adults with Visual Impairment

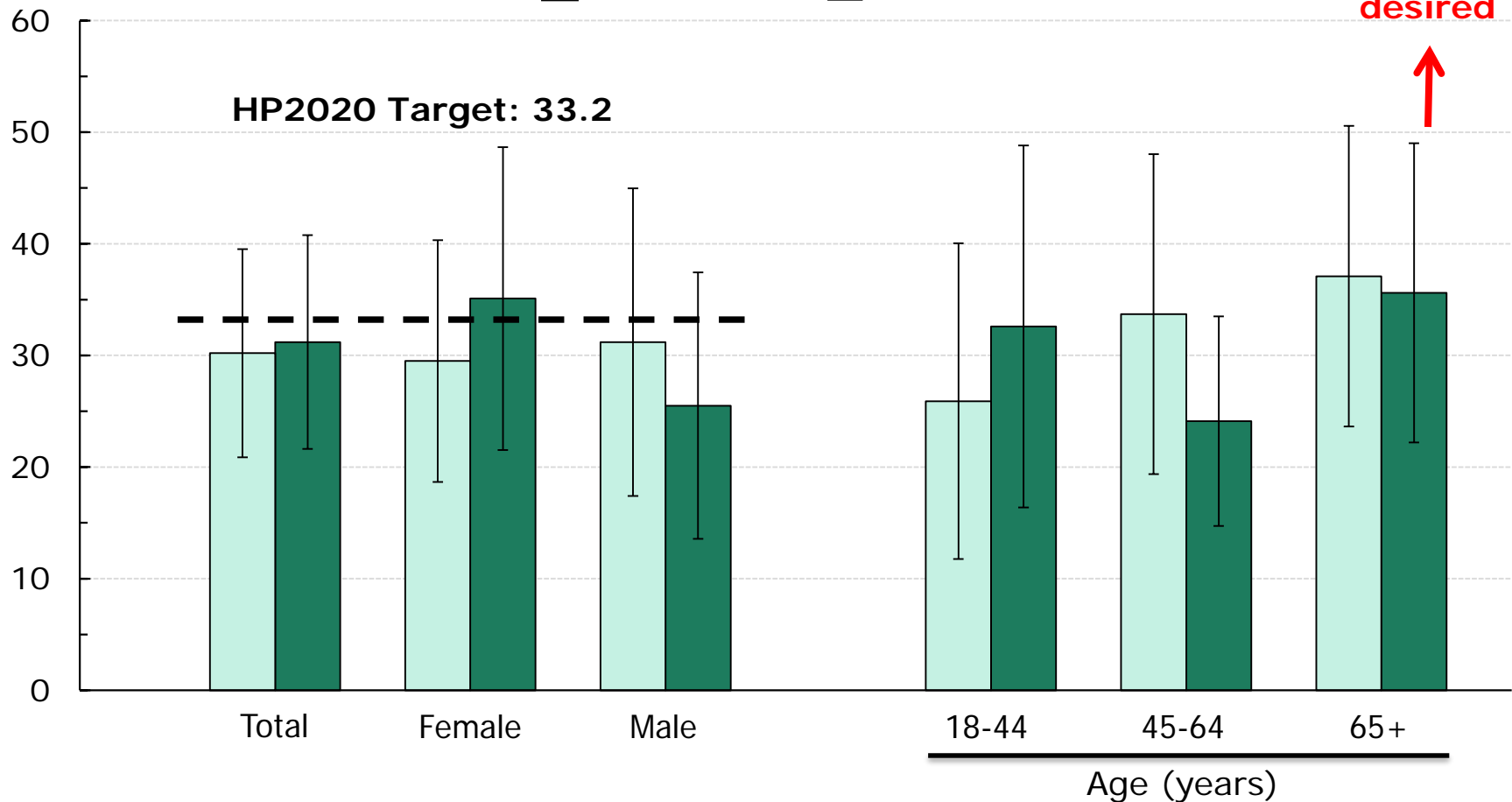
Healthy People  
2020

Rate per 1,000

2008

2016

Increase  
desired



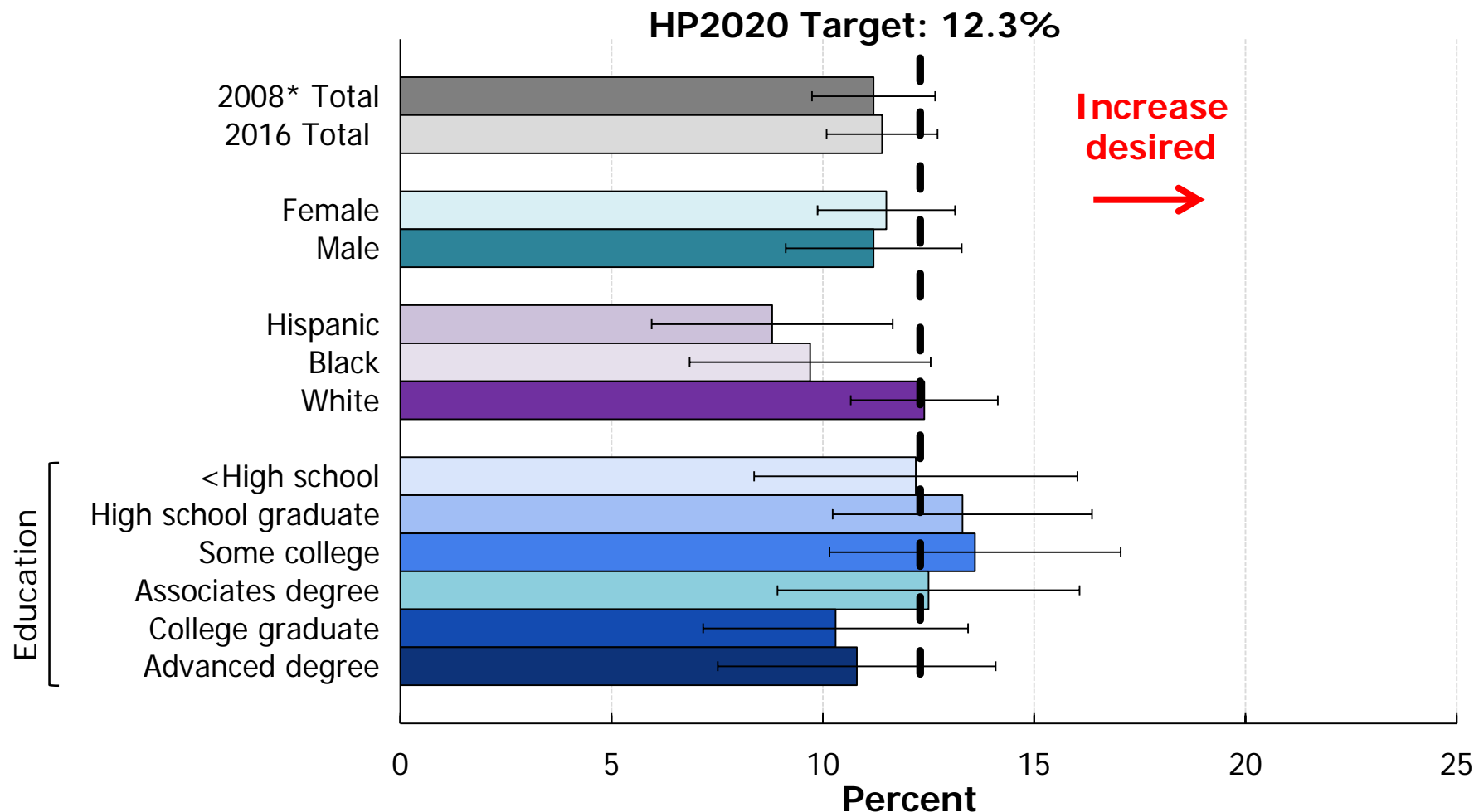
NOTES: I = 95% confidence interval. Data are for adults aged 18 years and over who reported trouble seeing even when wearing glasses or contact lenses and use of vision rehabilitation services such as job training, counseling, or training in daily living skills and mobility. Except for age-specific estimates, data are age-adjusted to the 2000 standard population.

Target is not applicable to age groups.

SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

Obj. V-7.1

# Visual Assistive and Adaptive Devices, Adults with Visual Impairment, 2016

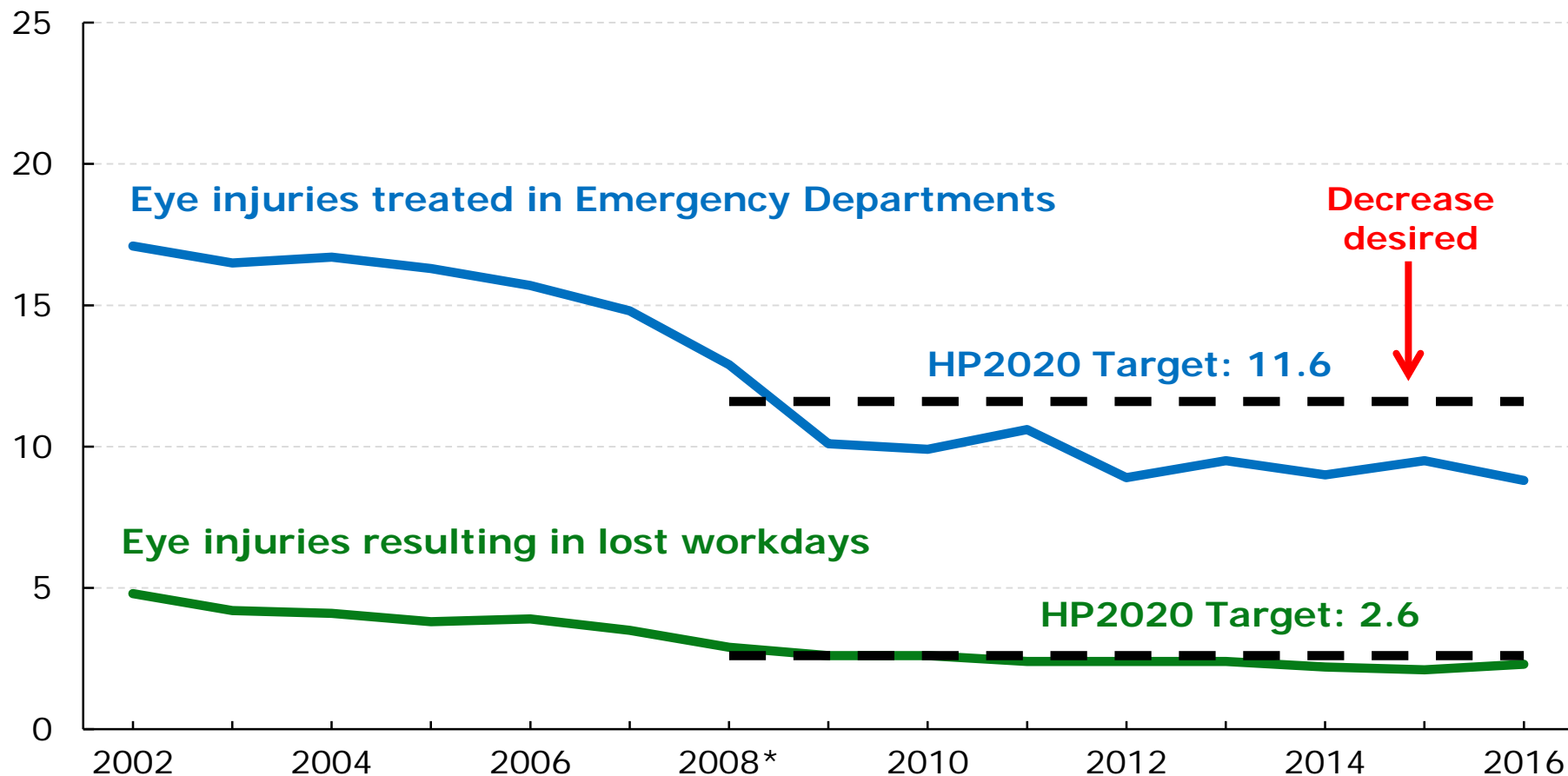


NOTES: — = 95% confidence interval. 2008\* = HP2020 baseline. Except for education, data are for adults 18 years and over, who have trouble seeing and use any visual assistive and adaptive devices such as telescopic or other prescriptive lenses, magnifiers, large print or talking materials, CCTV, white cane, or guide dog. Black and white exclude persons of Hispanic origin. Persons of Hispanic origin may be any race. Respondents were asked to select one or more races. Data for the single race categories are for persons who reported only one racial group. Educational attainment data are for adults aged 25 and over. Data are age-adjusted to the 2000 standard population. SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

# Occupational Eye Injuries

Healthy People  
2020

Rate per 10,000



NOTES: 2008\* = HP2020 baseline. Rate per 10,000 full-time equivalent workers aged 16 years and older. Data are for occupational eye injuries or illnesses treated in hospital emergency departments; and for occupational eye injuries among private industry employees that required medical treatment beyond first aid and that resulted in one or more days away from work. The eye injury or illness resulted from an event in the work environment.

SOURCES: National Electronic Injury Surveillance System (NEISS), CPSC; Current Population Survey (CPS), Census and DOL/BLS; Survey of Occupational Injuries and Illnesses (SOII), DOL/BLS.

Objs. V-3.1 & 3.2

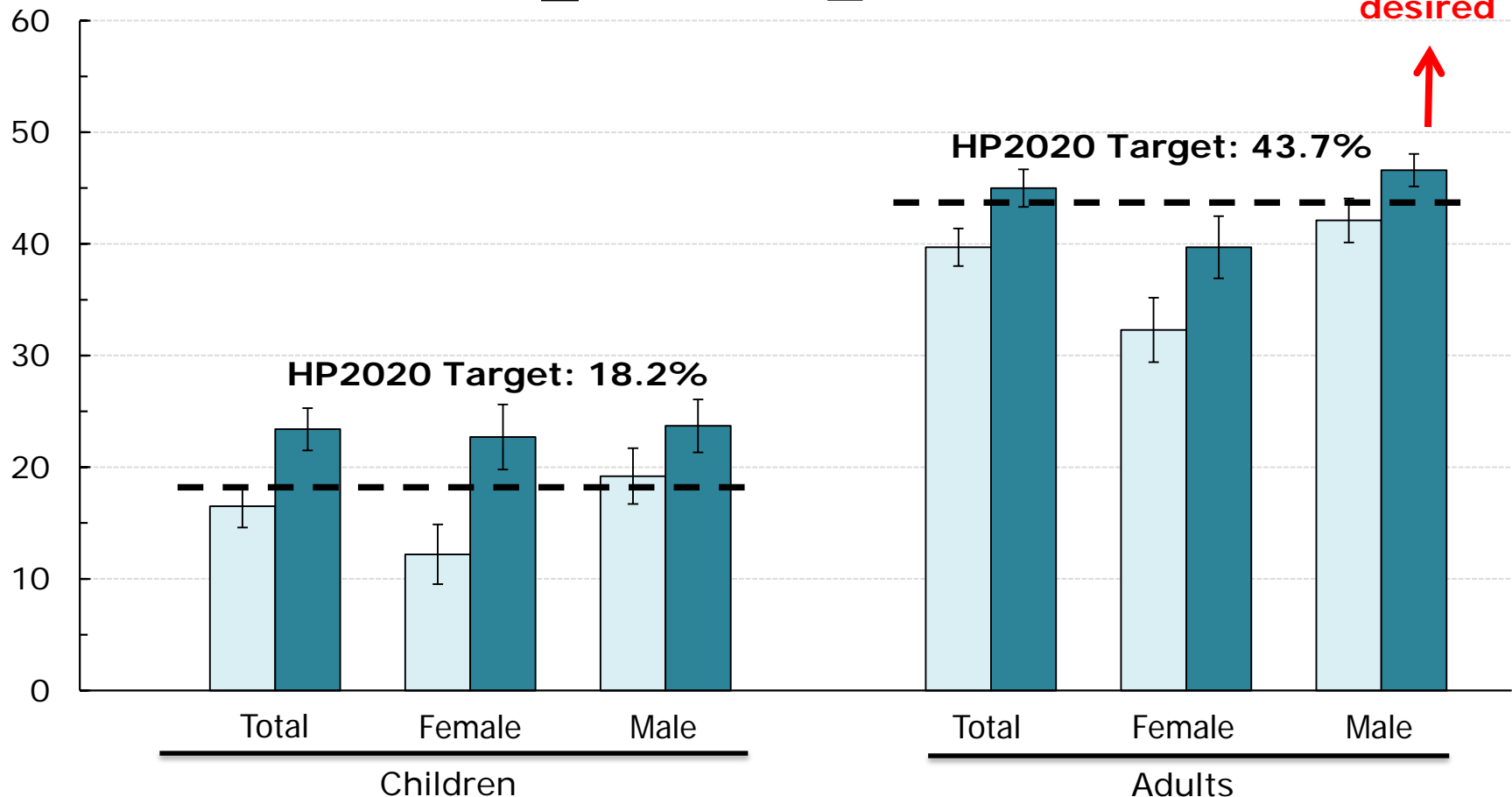
# Protective Eyewear Use at Home: Always or Most of the Time

Percent

2008

2016

Increase  
desired



NOTES: I = 95% confidence interval. Data are for children 6-17 years and adults aged 18 years and over who were involved in activities that can cause eye injury and who wore protective eyewear always or most of the time. Adult data are age-adjusted to the 2000 standard population.  
SOURCE: National Health Interview Survey (NHIS), CDC/NCHS.

Objs. V-6.1 & 6.2

# Key Takeaways – Hearing and Other Sensory or Communication Disorders



- Between 2007 and 2015, the percent of newborns and infants who received hearing screening, evaluation, and intervention services increased. One objective has met its HP2020 target and two objectives are improving.
- Noise-induced hearing loss among adults aged 20-69 years decreased between 2003-04 and 2011-12. The objective met its HP2020 target.
- In 2014, 61.8% of adults aged 18 years and over with tinnitus had been seen or referred to specialists.
- In 2016, 42.1% of adults aged 18 years and over with dizziness or balance problems reported falls caused by dizziness or imbalance.
- In 2013-14, 12.1% of adults aged 40 years and over with smell or taste disorders discussed their problem with a healthcare provider in the past 12 months.



# Key Takeaways – Vision



- In 2016, 47.1% of children aged 5 years and under had a vision screening and 57.4% of adults aged 18 years and over had a dilated eye examination.
- Between 2008 and 2016, the rates of visual impairment due to diabetic retinopathy, glaucoma, and cataract showed little or no detectable change. The objective on visual impairment due to macular degeneration has met its target.
- Vision rehabilitation and visual adaptive device use among adults with visual impairment remained low. These objectives showed little or no detectable change between 2008 and 2016.
- In 2016, the objectives on occupational eye injuries have met their Healthy People 2020 targets.
- In 2016, 23.4% of children 6-17 years and 45.0% of adults aged 18 years and over participating in activities that can cause eye injury used protective eyewear always or most of the time. These objectives have met their Healthy People 2020 targets.

# Healthy People 2020: NIDCD Efforts to Prevent, Diagnose, and Treat Communication Disorders

James F. Battey, Jr., M.D., Ph.D.

Director, National Institute on Deafness  
and Other Communication Disorders, NIH

February 22, 2018



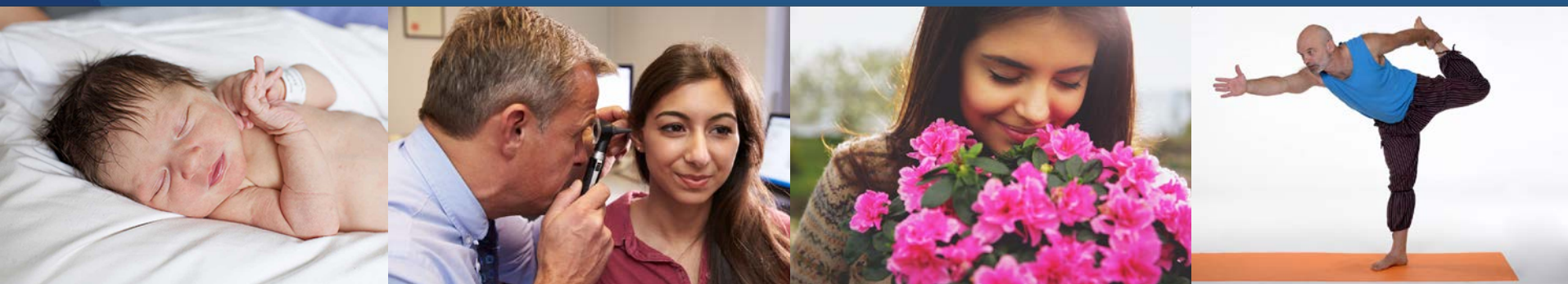
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and Health Promotion



National Institute on  
Deafness and Other  
Communication Disorders

# The NIDCD's Mission

Healthy People  
2020



To support research and research training to prevent, detect, diagnose, and treat conditions in **hearing** and **balance**, **taste** and **smell**, and **voice**, **speech**, and **language**.

We seek to improve the lives of **more than 65 million people** in the United States who have a communication disorder.



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National Institute on  
Deafness and Other  
Communication Disorders

# Objectives 1.1, 1.2, 1.3

## Newborn Hearing Screening

- Before 1993, fewer than 1 in 10 newborns in the U.S. were screened for hearing loss.
- In 2000, the NIDCD supported a multicenter study that established the necessary technologies to screen newborns for hearing loss. These noninvasive tests are still used today.
- **Today**, about 90% of infants are screened for hearing loss during the first month of life and 98% during their first year.



NOTE: [https://www.cdc.gov/ncbddd/hearingloss/2014-data/2014\\_ehdi\\_hsfh\\_summary\\_h.pdf](https://www.cdc.gov/ncbddd/hearingloss/2014-data/2014_ehdi_hsfh_summary_h.pdf) [PDF - 437 KB]

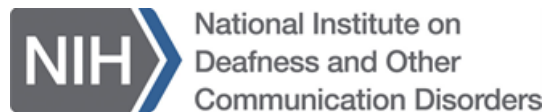
# Objectives 1.1, 1.2, 1.3

## Newborn Hearing Screening

Healthy People  
2020

### New Law Strengthens Early Hearing Screening Program

- October 2017 – President Trump signed the Early Hearing Detection and Intervention Act.
- It reauthorizes the NIH, the CDC, and HRSA to continue a long-standing partnership to coordinate and advance a national program for the early identification and diagnosis of hearing loss and intervention services for newborns, infants, and young children.



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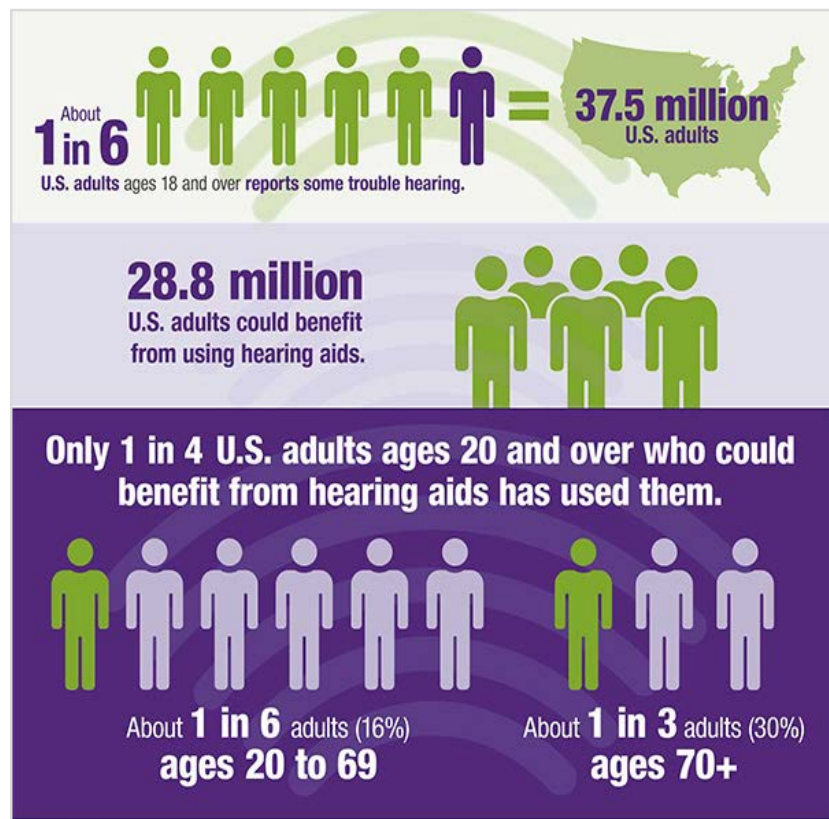




# Objectives 3.1 and 3.3

## Hearing Aid Use in Adults

### Low Use of Hearing Aids



- 2009 – The NIDCD began supporting research on accessible and affordable hearing health care.
- Two reports stress the need for improving hearing health care access and affordability:
  - October 2015 – President’s Council of Advisors on Science and Technology
  - June 2016 – National Academies of Sciences, Engineering, and Medicine
- August 2017 – President Trump signed law authorizing the FDA to develop guidelines for a class of over-the-counter hearing aids.

NOTE: <https://www.nidcd.nih.gov/shareable-images/infographic-hearing-loss-and-hearing-aid-use>

# Objective 7

## Noise-Induced Hearing Loss in Adolescents

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2020

### Campaign to Prevent Hearing Loss

- The NIDCD's *It's a Noisy Planet. Protect Their Hearing.*® public education campaign is aimed at preteens (children ages 8 to 12), their parents, and other educators on the causes and prevention of NIHL.
- Launched in 2008, the campaign has reached about 6 million people.
- About 827,000 materials in English and Spanish have been distributed.
- Since 2010, about 20,000 students in the Washington, DC, area have been reached through school presentations.

○ <https://www.noisyplanet.nidcd.nih.gov>

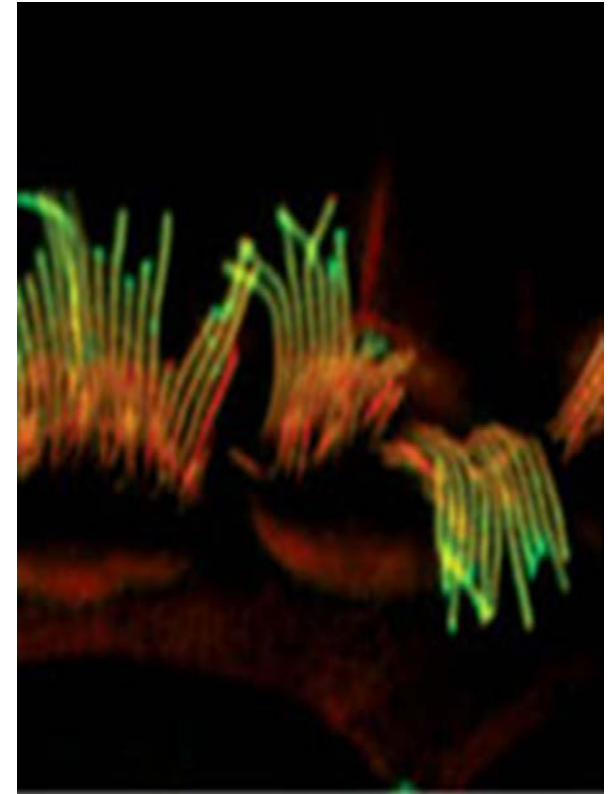


# Objective 8

## Noise-Induced Hearing Loss (NIHL) in Adults

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2020

- As many as 24% of American adults under age 70 may have hearing loss due to noise exposure.
- The NIDCD's research on NIHL includes:
  - Identifying gene mutations that make individuals more susceptible to NIHL.
  - Studying cellular mechanisms that lead to noise-induced hearing damage.
  - Understanding ways that the ear protects itself from noise damage.
  - Developing molecules/drugs that can prevent or treat noise-induced hearing damage.



Noise-damaged hair cells of the inner ear.

NOTE: <https://www.nidcd.nih.gov/health/noise-induced-hearing-loss>



# Objective 9.2

## Tinnitus

- Approximately 10% of U.S. adults has had tinnitus lasting at least 5 minutes in the past year.
- NIH-supported clinical trials of treatments for tinnitus:
  - A study of a device to stimulate the vagus nerve to rewire brain connections
  - Brain stimulation studies



Setup pairing Vagus Nerve Stimulation (VNS) with tones. The inset shows the electrode lead wrapped around the vagus nerve. A pulse generator is implanted under the chest wall. *Image courtesy of MicroTransponder, Inc.*

NOTE: <https://www.nidcd.nih.gov/health/statistics/quick-statistics-hearing>

# Objective 15.1

## Balance and Dizziness

- About 15% of American adults (35 million) reported having a balance or dizziness problem during the past year.
- The NIDCD is supporting a clinical trial to develop tools that can help hospital emergency room physicians better diagnose balance problems.



NOTE: <https://apha.confex.com/apha/2017/meetingapp.cgi/Paper/384250>.

# Objective 16

## Chemosensory (Taste and Smell) Disorders

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2020

- Roughly 12% (13 million) of Americans aged 40 or older had an impaired sense of smell. As the population ages, more people will likely be affected.
- Effective, evidence-based ways to prevent or treat taste and smell disorders have not been developed. More clinical research on these disorders is needed.
- To address this need, the NIDCD is dedicated to building a critical mass of clinical researchers to conduct patient-oriented studies and develop treatments for taste and smell problems.



NOTES: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5033684/>



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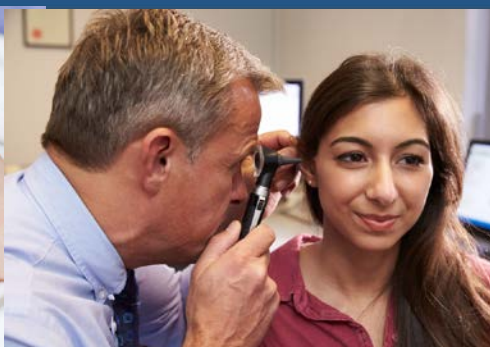
Office of Disease Prevention  
and Health Promotion



National Institute on  
Deafness and Other  
Communication Disorders

# Connect With the NIDCD

Healthy People  
2020



**The NIDCD would like to thank NCHS.**



Web: <https://www.nidcd.nih.gov>



Twitter: <https://twitter.com/nidcd>



Facebook: <https://www.facebook.com/NoisyPlanet>

Content Syndication: <https://www.nidcd.nih.gov/content-syndication>

NIDCD Information Clearinghouse:

- Voice: (800) 241-1044
- Email: [nidcdinfo@nidcd.nih.gov](mailto:nidcdinfo@nidcd.nih.gov)



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National Institute on  
Deafness and Other  
Communication Disorders



# Healthy People 2020 Progress Review: The Diagnosis, Prevention, and Treatment of Sensory Disorders

Paul A. Sieving, M.D., Ph.D.  
Director, National Eye Institute, NIH



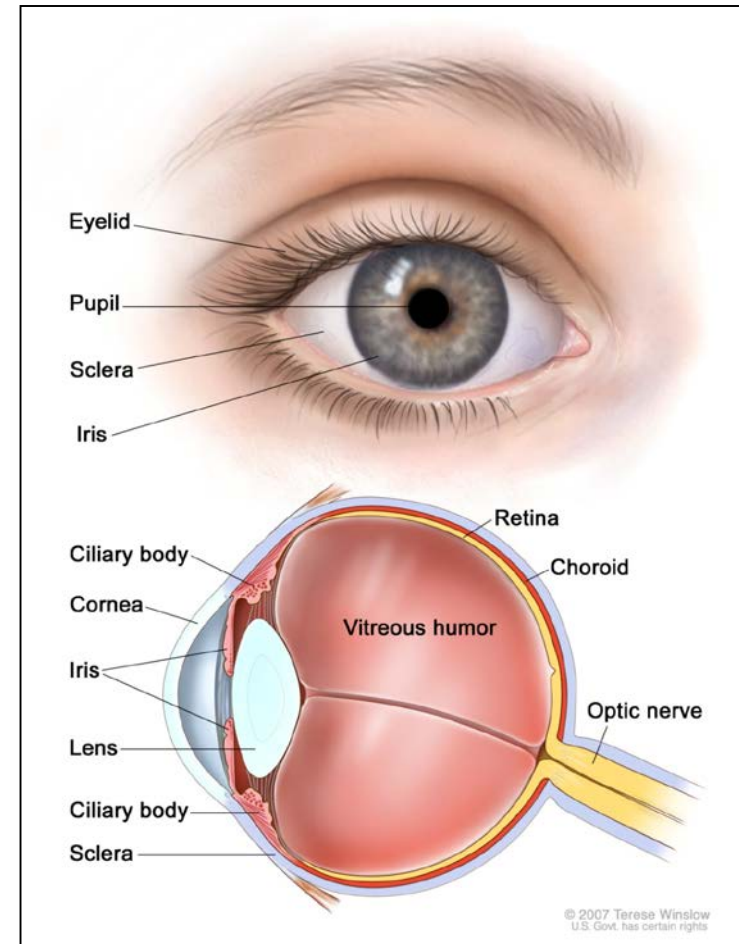
Office of Disease Prevention  
and Health Promotion



National Eye Institute

## Research to Improve Vision Health:

- Population Research
- Clinical Research
- Basic Laboratory Research
- Public Outreach and Education
- Vision Rehabilitation



## Technology Identifies Blinding Disease in Premature Babies

- **Retinopathy of prematurity (ROP)**—a blinding disorder affecting very premature infants
- **Prompt diagnosis and treatment can improve outcomes**
- **NEI Telemedicine trial** demonstrated that remote screening is highly successful
  - Trained non-physicians reviewed eye images
  - Correctly identified 159/162 cases (98%)
  - Infants needing specialty care referred to doctor, improving outcomes
  - Expands eye care options for rural and underserved communities



# Objective V-1

## Vision Screening in Preschoolers

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### Vision Screening is Critical for School Readiness

- **Early detection and treatment** can reduce vision loss
- **Vision In Preschoolers (VIP) Study**
  - Vision impairment leads to reading and learning deficits
  - Well trained nurses can effectively screen children
  - Children needing eye care referred to an eye care professional
- **US Preventive Services Task Force** recommends vision screening in children ages 3-5





### Research Shines Light on Reducing Myopia in Children

- Children with **myopia** cannot see distance objects clearly
- Myopia can be corrected with eyeglasses or contact lenses
- Prevalence of myopia is increasing
- The CLEERE study examined the impact of “near work”:

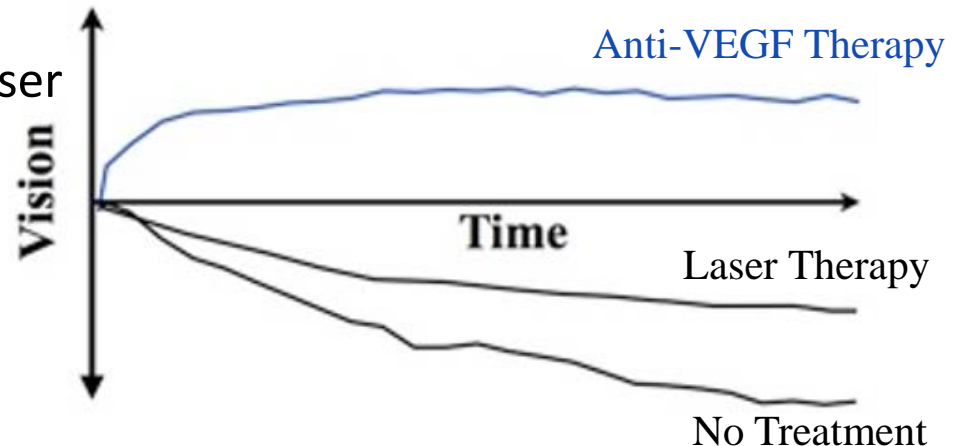


- **Children who spent more time outdoors (>14 hrs/wk) reduced their risk of myopia**
- Exercise may play a role, but bright sunlight seems to be the key
- **Encourage children to play outdoors!**

# Objective V-5.2 Diabetic Retinopathy

## Develop Therapies through Diabetic Retinopathy Network

- **Diabetic Retinopathy (DR)** is leading cause of vision loss in working-age adults
- **DR Clinical Trial Network** brings together academic and community clinics
- **Private-Public Partnership**
- **Anti-VEGF Therapy** is better than laser
  - Without treatment, vision continues to deteriorate
  - Drugs stopped vision loss, and **improved vision**
  - Changed standard of care



# Objective V-5.5

## Age-Related Macular Degeneration

### New Prevention and Treatments for AMD

- **Age-Related Macular Degeneration** is leading cause of vision loss in adults age  $\geq 65$
- **Prevention—** Age-Related Eye Disease Studies (AREDS) demonstrated 27% risk reduction through nutritional supplements
  - Vitamins
  - Antioxidants based on leafy green vegetables
  - Zinc and copper
- **Genomics—** Discovery of 34 risk genes opens door to future therapies
- **Environment—** Smoking  
UV exposure  
Unhealthy diet
- **Treatment—** Anti-VEGF drugs for one form of AMD



# Objective V-7

## Increase Vision Rehabilitation

### Improving Quality of Life for People with Low Vision

- **Rehabilitation training**, uses brain plasticity
  - Audio-based “video” game environment
- **Assistive devices and navigational aids**
  - Smartphone aps that read street signs or convert drug labels to text
  - Robotic walking cane that detects objects and talks to user
- **Artificial Retina Prosthesis (ARGUS II)**—FDA approved in 2013; restores vision to patients with inherited blinding disease
  - Camera on glasses relays visual scenes to wireless electrode array implanted in the eye



- **Small Business grants**—Product development to bring tools to market

# Objective V-4

## Increase Comprehensive Eye Exams

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### Public Eye Health Education and Awareness

**National Eye Health Education Program (NEHEP)** teaches eye health literacy to the public



- Educates medical providers and patients about **science-based treatments and preventions**
- Conducted through **public-private partnerships**
- **Targets populations at increased risk** for eye diseases (African Americans, Hispanics/Latinos, and older adults)
- Focuses on increasing clinical care for **diabetic eye disease** and **glaucoma**
- Encourages **vision rehabilitation** for low vision patients



Diabetic Eye Disease



Glaucoma



Low Vision



¡Ojo con su visión!



Vision and Aging



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# Objective V-6 Use Protective Eyewear

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## Achieving Healthy People Objectives through *Healthy Vision Month*

NEI established May as *Healthy Vision Month* to promote **eye health as a priority**

Messages for social media, campaigns, and TV ads:

1. Get a comprehensive dilated eye exam
2. Live a healthy lifestyle, including
  - ✓ Healthy foods
  - ✓ Healthy weight
  - ✓ Managing chronic conditions
  - ✓ Not smoking
3. Know your family history
4. Use protective eyewear
5. Wear sunglasses



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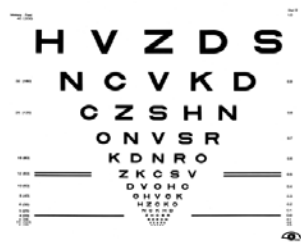
Office of Disease Prevention  
and Health Promotion



National Eye Institute

# Stay Connected to NEI

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**National Eye Health Education Program** [nei.nih.gov/nehep](http://nei.nih.gov/nehep)  
**Facebook:** [www.facebook.com/NationalEyeHealthEducationProgram](https://www.facebook.com/NationalEyeHealthEducationProgram)  
**NEI Social Media:** [nei.nih.gov/tools/stay\\_connected](http://nei.nih.gov/tools/stay_connected)

**Phone:** (301) 496-5248—English and Spanish

**Email:** [2020@nei.nih.gov](mailto:2020@nei.nih.gov)

**Web:** [www.nei.nih.gov](http://www.nei.nih.gov)



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National Eye Institute

# Development of a Community-based Hearing Health Education and Support Program for Adults with Hearing Loss and their Families



**Nicole Marrone, Ph.D., CCC-A**

James S. and Dyan Pignatelli/UniSource Clinical Chair in Audiologic Rehabilitation for Adults

Assistant Professor, Department of Speech, Language, and Hearing Sciences,  
University of Arizona, Tucson, Arizona

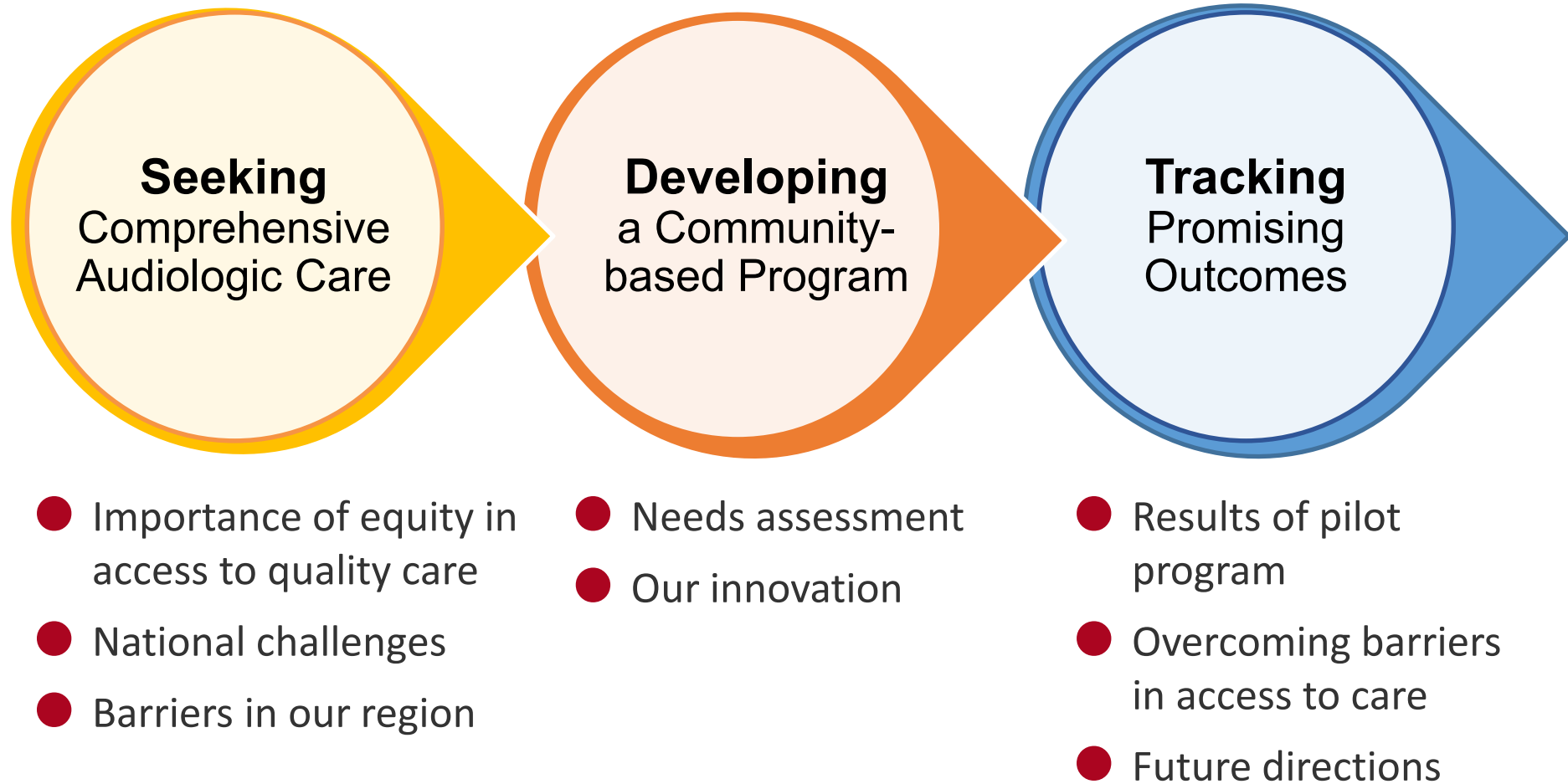
Funded by: NIH NIDCD  
R21/R33 DC013681



Healthy People 2020 Progress Review  
February 22, 2018



# Overview



# Access to comprehensive hearing health care is important for the health and wellbeing of all Americans.



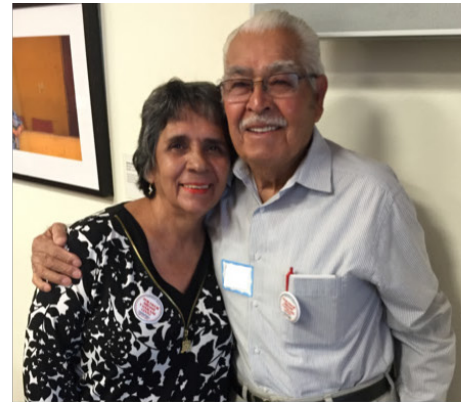
## Medical services

e.g., Screening and assessing the auditory system;  
Otolaryngology



## Diagnostic audiology services

e.g., Evaluate degree, type, configuration of hearing loss and its functional impacts on daily life



## Rehabilitative audiology services

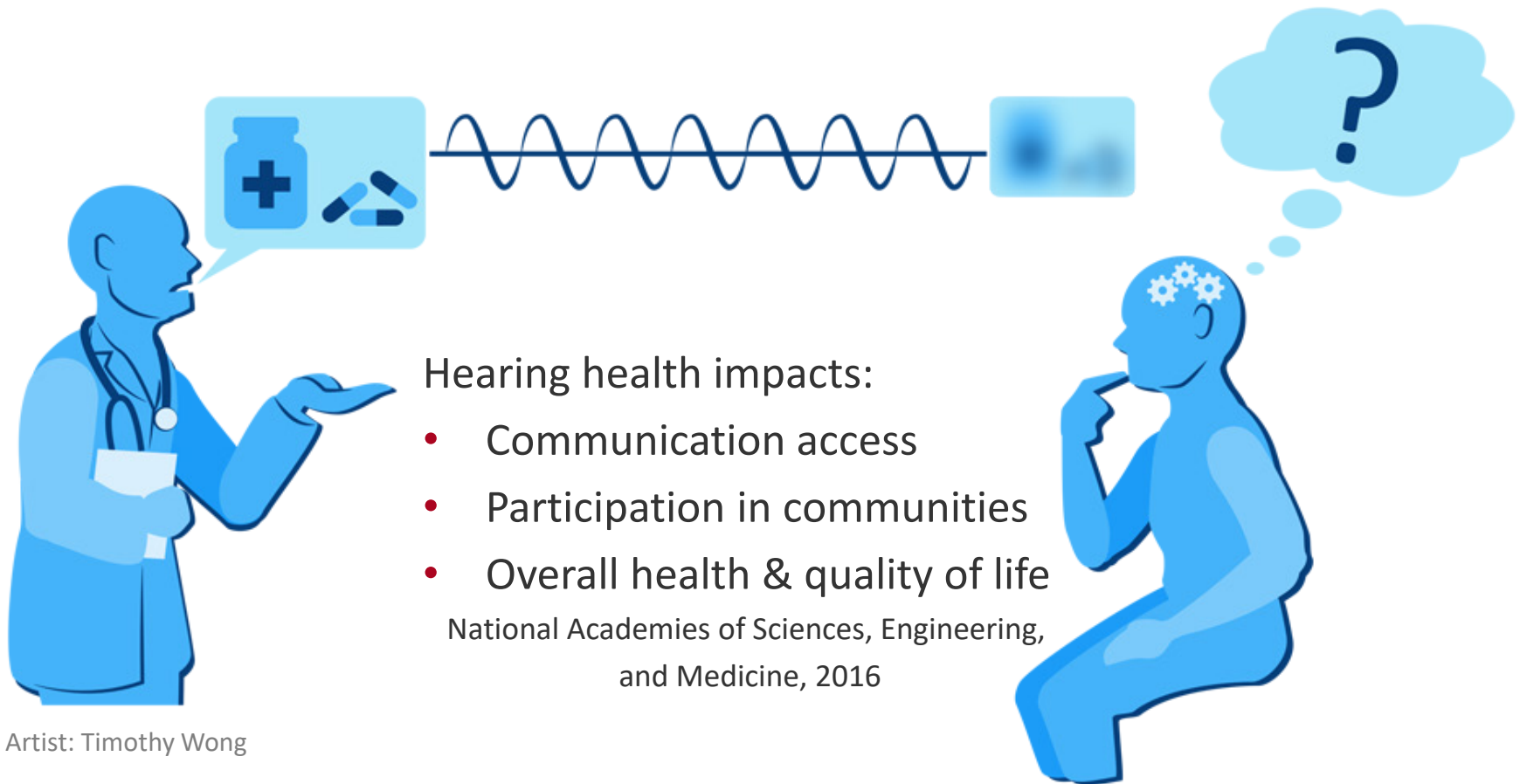
e.g., Family-centered care, counseling, amplification, assistive technology, ongoing management and aural rehabilitation



## Preventive services

e.g., Health education, hearing conservation  
*("It's a Noisy Planet: Protect Their Hearing")*

# Hearing loss affects health and quality of life, like other sensory and communication disorders.



Artist: Timothy Wong

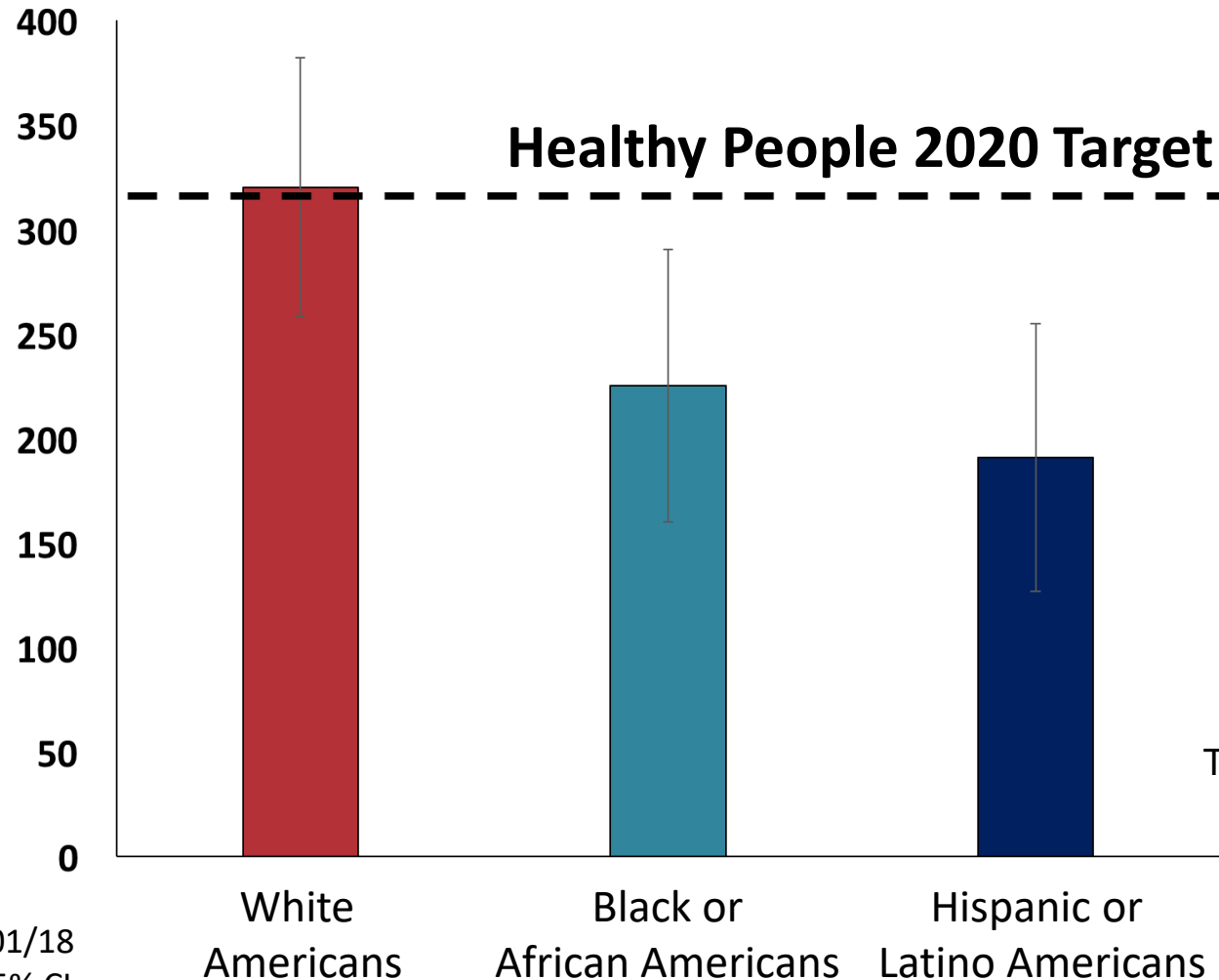
**Nearly 2 in 3 Americans age 70+ are living with hearing loss.**

# Challenges in access to comprehensive audiologic care in the U.S.

- **Significant gaps in care**, between self-reporting hearing loss and receiving evaluation, treatment, and rehabilitation services (Mahboubi, Lin, & Bhattacharyya, 2017).
- **Nationally, rehabilitative services from audiologists are not covered by Medicare** (National Academies of Sciences, Engineering, and Medicine, 2016).
- **Coverage varies across state Medicaid systems** for adults (Arnold, Hyer, & Chisolm, 2017).
  - Adults with **lower socioeconomic status** are less likely to use hearing aids (Bainbridge & Ramachandran, 2014).

# Hearing Aid Use in the U.S. by race/ethnicity

Rate per 1,000 Adults 70+ years with moderate or greater hearing impairment



Data Source:

HP2020

ENT-VSL-3.3

2011-2013

Accessed 02/01/18

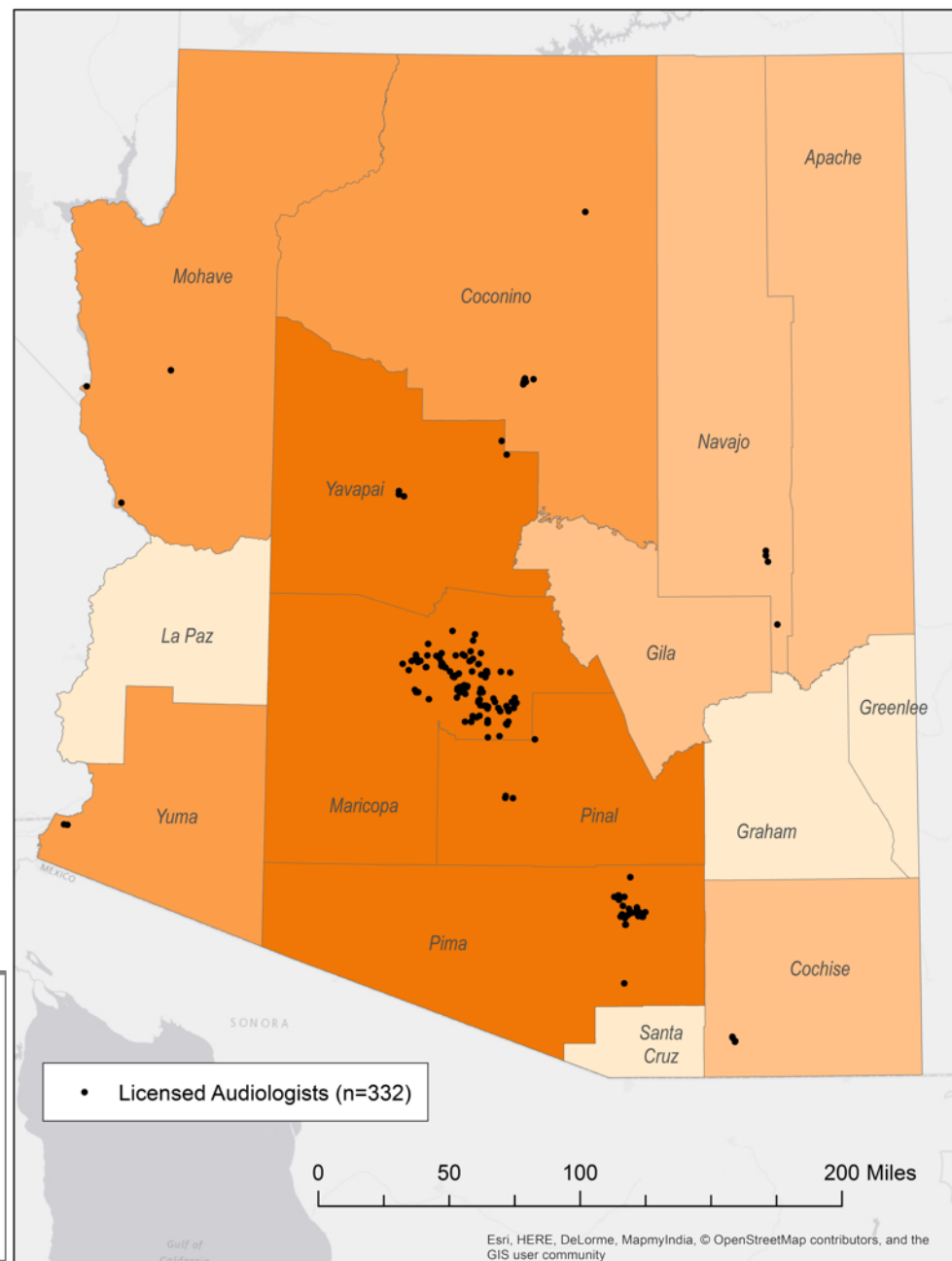
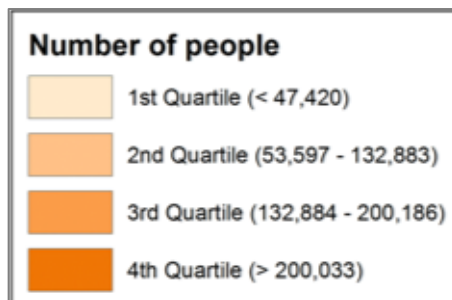
Error bars  $\pm$  95% CI

See also Nieman,  
Marrone, Szanton,  
Thorpe, & Lin (2016),  
*J Aging Health*

# Availability of Health Care Providers in Rural Areas

- **Rural USA:** shortages of health care providers (Chan et al., 2017; Goins et al. 2005; Rosenblatt et al., 2006).
- **Arizona:** 6 non-metro counties without any audiologists (Coco, Sorlie Titlow, & Marrone, submitted)

Data Source: Licensed dispensing audiologist practice locations; list accessed 06/17/17 from Arizona Department of Health and Human Services



# **Our Approach:**

## **Community-Based Participatory Research**



A strategy for reducing health disparities in underserved communities that:

- Helps define health needs;
- Increases trust and bridges cultural gaps;
- Enhances relevance of research and accuracy of study findings.

# **Our Innovation:**

## **Collaboration between Audiologists and Community Health Workers**

### **Audiologists**

are health care professionals who provide care in the prevention, diagnosis, treatment, and management of hearing loss, other auditory and balance disorders

(Bureau of Labor and Statistics, 2018).

### **Community health workers**

are “frontline,” lay public health workers who share sociocultural characteristics with their community and provide culturally-relevant health education

(American Public Health Association).

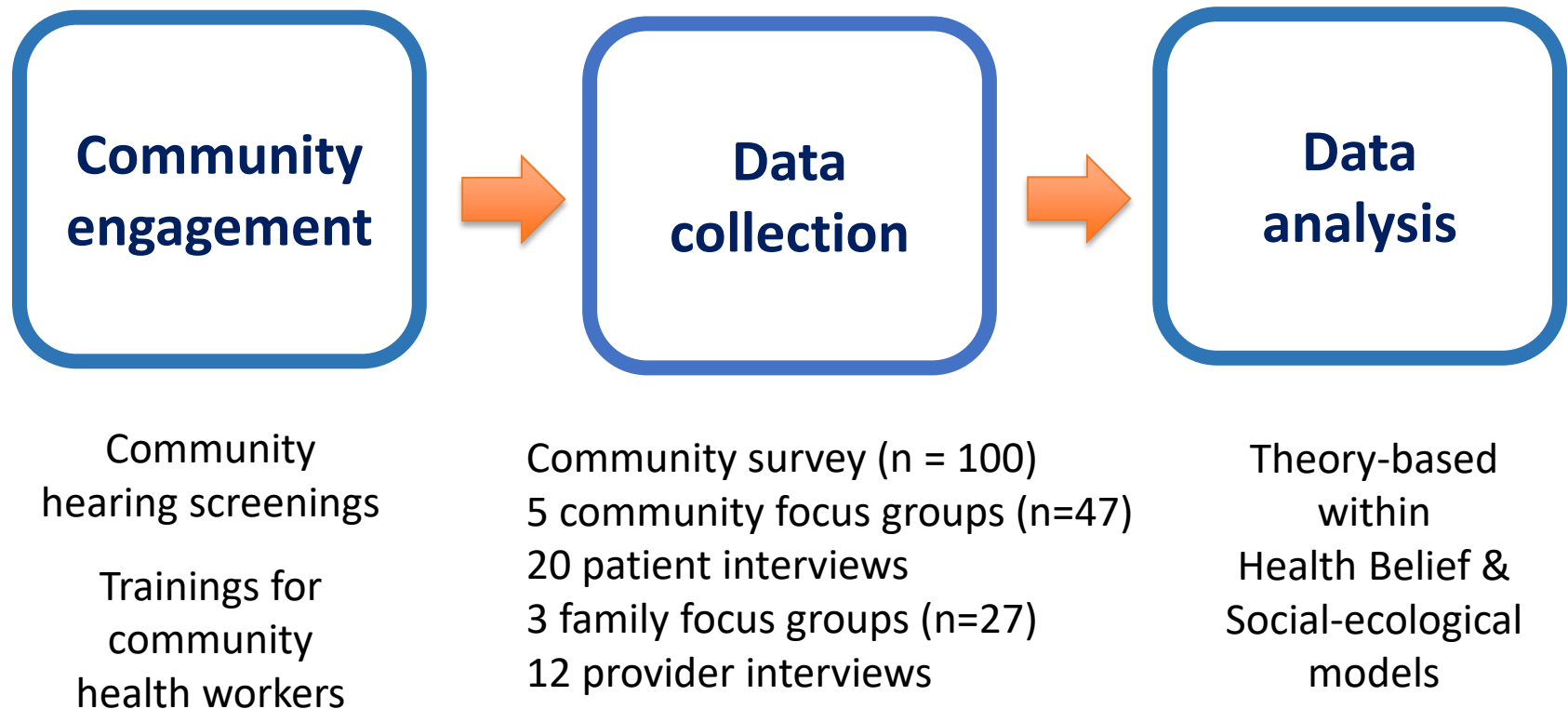
- For our research, audiologists have trained community health workers on recognizing hearing concerns and communicating effectively with people with hearing loss in their programs and community (Sánchez et al., 2017).



# Community Needs Assessment

Ingram et al. (2016), *Frontiers in Public Health*

n = 206



# Key barriers to be addressed

- **Lack of knowledge and resources on hearing loss**
  - Perception that the “only” intervention (i.e., hearing aid) is out of reach
- **High perceived severity of issue**
  - Many concerns related to depression, reduced participation
- **Low perceived self-efficacy**
  - Social withdrawal and lack of support
  - Frustrations of family
- **Gaps in access to care**
  - Medical providers not referring to Specialists due to perceived costs
  - Limited availability of local options
  - Limited trust of care requiring out-of-pocket expenses

Ingram et al. (2016),

*Frontiers in Public Health*

## Illustrative Quotes

*“Many people assume, ‘well, this is how I am, and this is how I’ll stay.’ We don’t seek help, but the problem is serious.”*

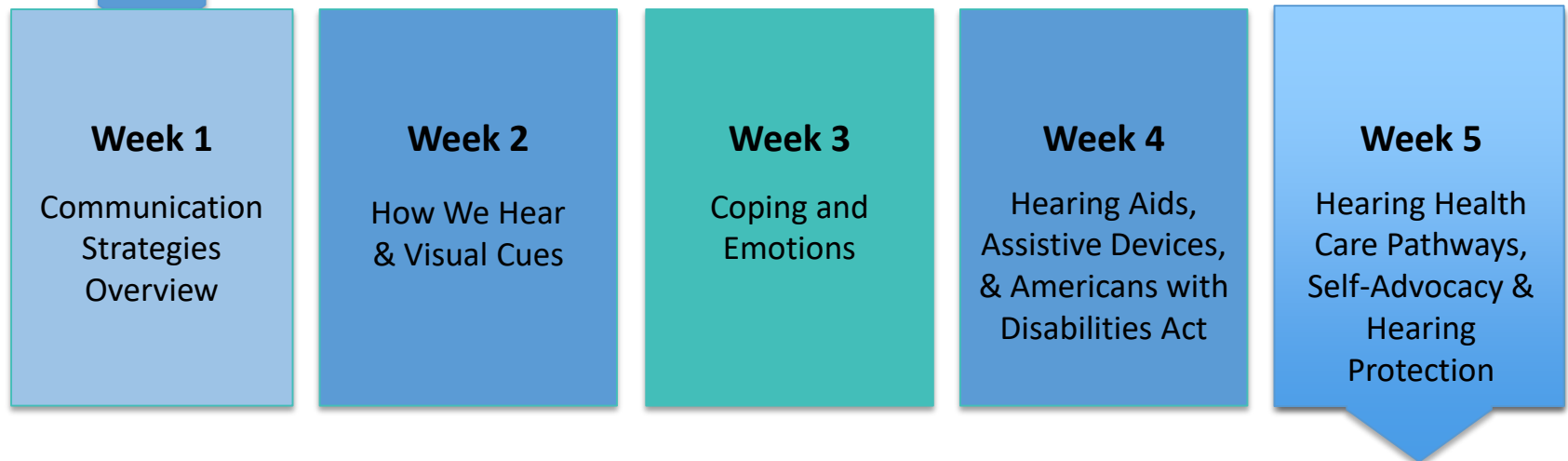
*“I know it is expensive so I don’t do anything.”*

*“Other health concerns have more attention and resources.”*



Hearing assessment and  
counseling by an audiologist  
at enrollment in program

Each weekly session facilitated by community health workers



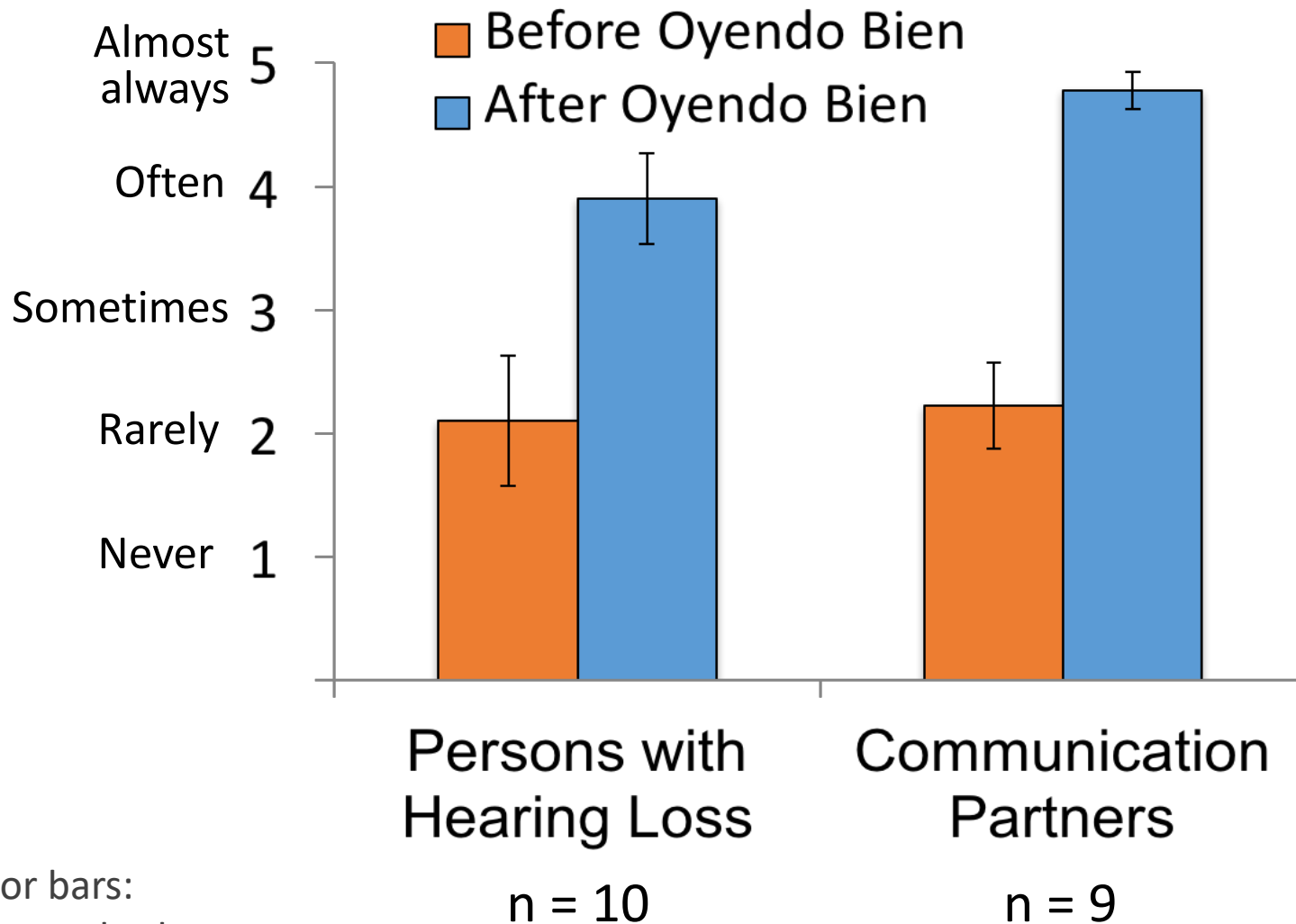
**Outcomes  
assessment**

**Pilot study: n = 21** (2 communication partners withdrew)

Marrone, Ingram, Somoza, Sánchez, Sanchez, Adamovich, & Harris (2017) *Seminars in Hearing*

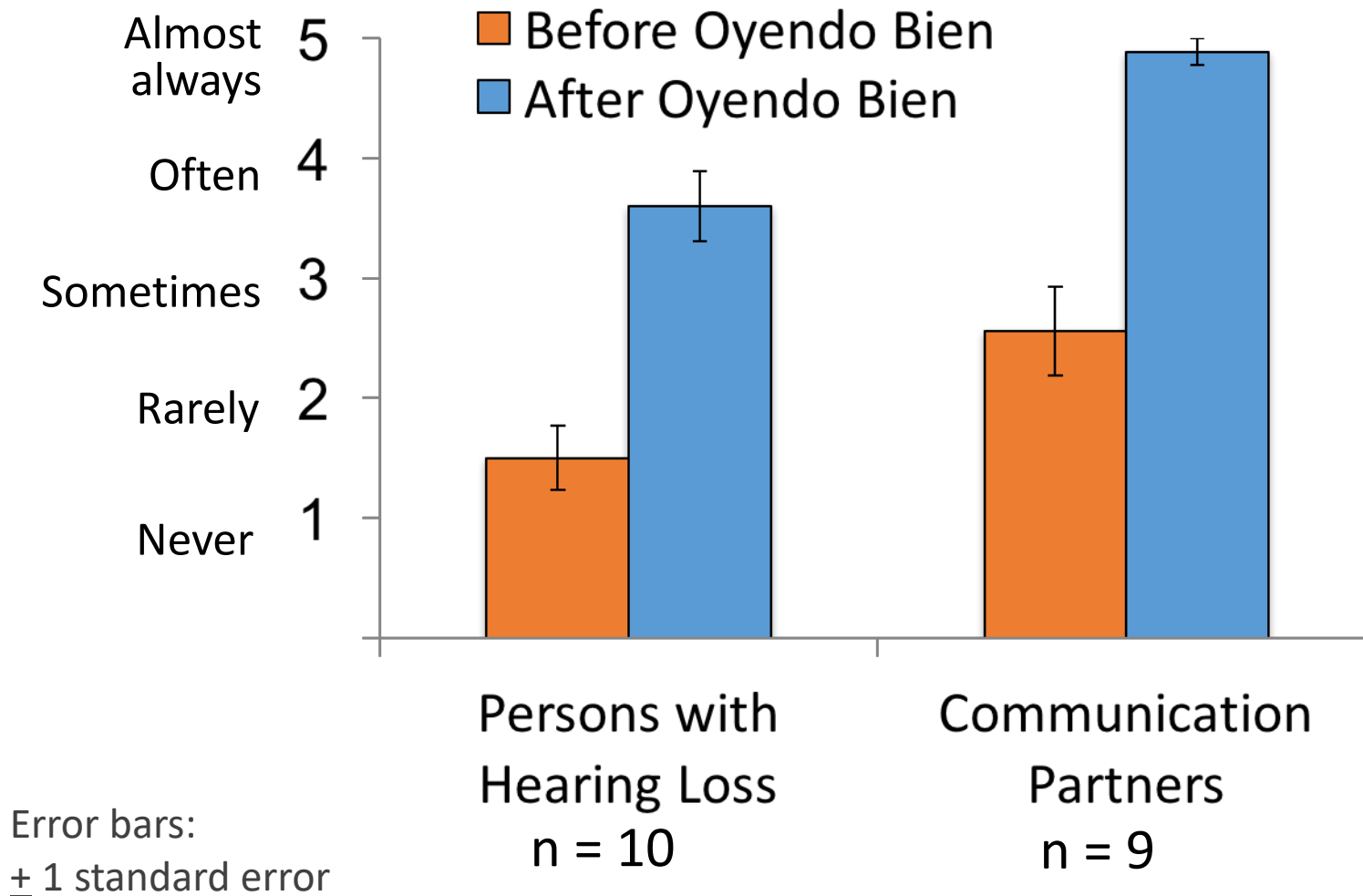
See also: Colina, Marrone, Sánchez, & Ingram (2017); Coco, Colina, Atcherson, & Marrone (2017)

# Pilot study results: Spoke slowly & clearly



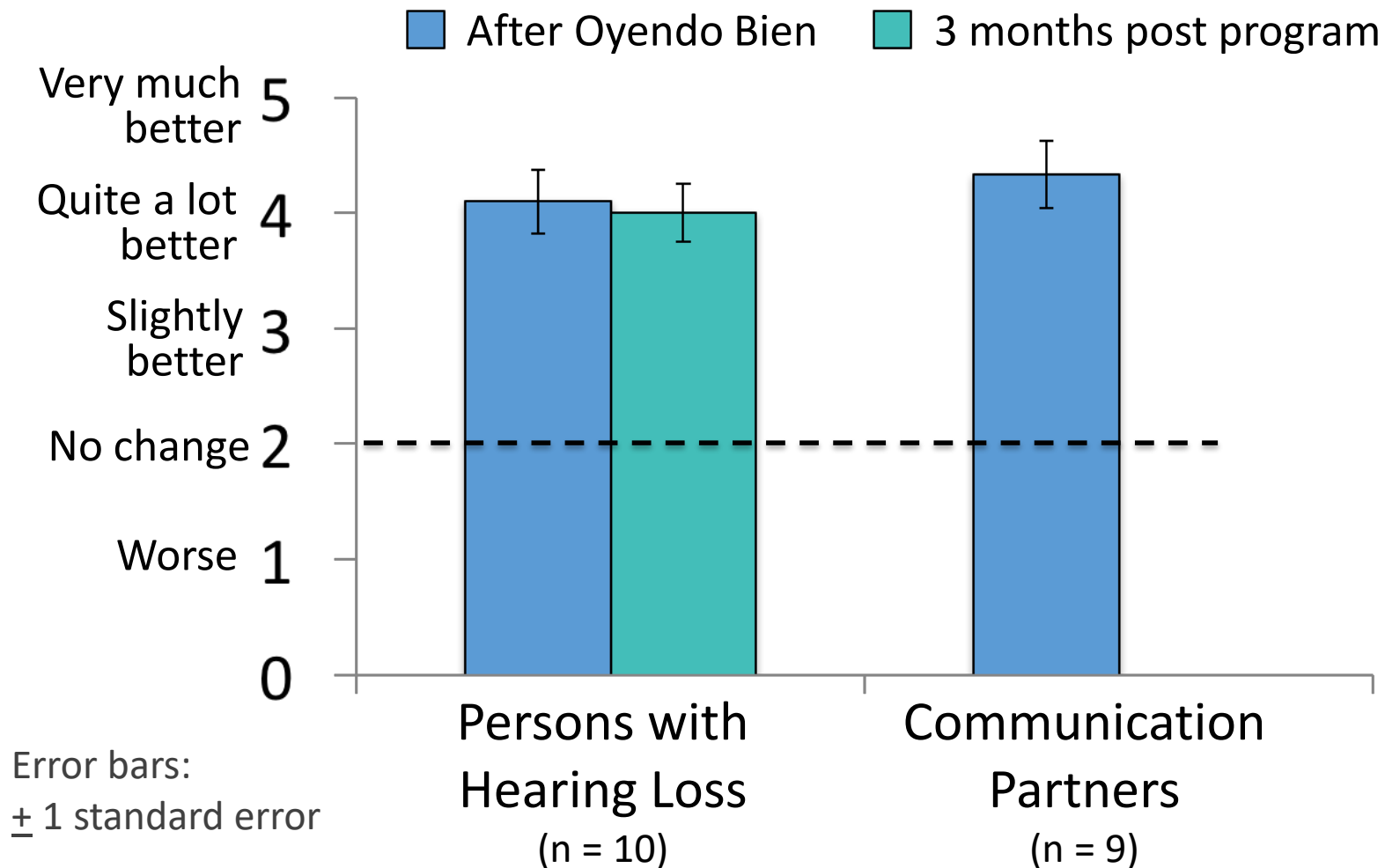
Error bars:  
± 1 standard error

# Pilot study results: Helped plan activities so partner with hearing loss can hear and participate



# Pilot study results: Enjoyment of Life

International Outcomes Inventory –Alternative Interventions Scale (Noble, 2002)

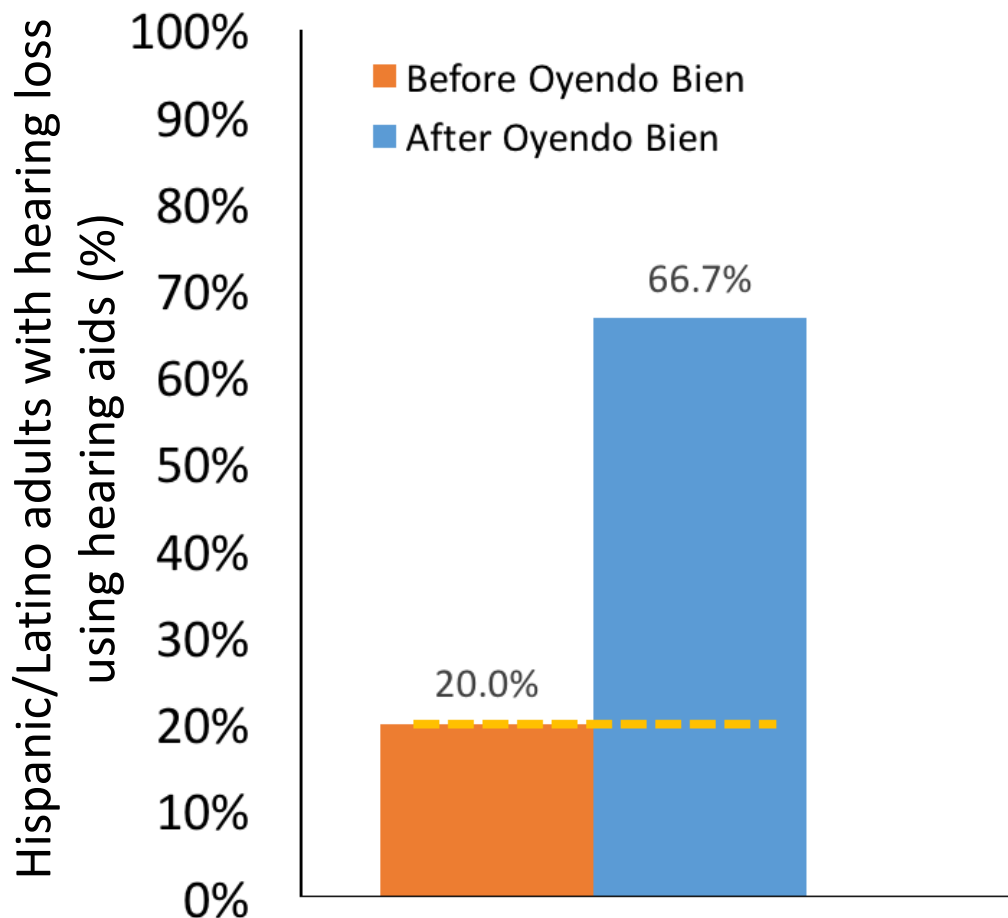




# Overcoming barriers in access to care:

## Hearing health care utilization outcomes

### 1 year post pilot study



*“You all taught us something new. Before attending the classes, I had almost no hearing. I now have one hearing aid and I have to go back in three weeks for a second...”*

#### **Pilot study outcomes:**

Marrone et al. (2017)

#### **Current research:**

Ongoing randomized trial

ClinicalTrials.gov NCT03255161

# *Returning to our example ...*

*After Oyendo Bien,  
a person may have more effective communication through:*



Artist: Timothy Wong

# Summary

- **Collaboration between audiology, public health, and the community** has led to a novel, culturally competent program with promising outcomes in quality of life and access to hearing health care (Marrone et al., 2017).
- Community health workers may serve as a feasible link between underserved communities and the hearing health care system; **continued research is needed** in this area and in other communities across the U.S. (e.g., Baltimore HEARS, Nieman et al., 2017).
- **Achieving health equity includes increasing access to, and use of, comprehensive audiologic care for all Americans.**

# Thank you

## University of Arizona

- *Speech, Language, & Hearing Sciences:* Nicole Marrone, PhD (PI), Aileen Wong, AuD, Adriana Sanchez, Laura Coco, AuD, Frances Harris, PhD, Clemente Morales, Alyssa Everett, Diane Cheek, Giau Le, AuD, Daisey Sánchez Jacob, AuD, Anette Real-Arrayga
- *Public Health:* Maia Ingram, MPH, Scott Carvajal, PhD, Jill de Zapien, Melanie Bell, PhD, Tanyha Zepeda
- *Spanish & Portuguese:* Sonia Colina, PhD
- *Geography:* Kyle Sorlie Titlow

## Mariposa Community Health Center

- Cecilia Navarro, Rosie Piper, Alicia Sander, Conchita Somoza, Patty Molina, Eladio Pereira, MD, Susan Kunz, MPH, Ed Sicurello



**\*OYENDO\* BIEN**



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Clinical Chair in Audiologic Rehabilitation

**[hearing2020@email.arizona.edu](mailto:hearing2020@email.arizona.edu)**

# Roundtable Discussion

Carter Blakey  
Deputy Director, Office of Disease  
Prevention and Health Promotion



Office of Disease Prevention  
and Health Promotion

# Healthy People 2020 Stories from the Field

Healthy People  
2020

*A library of  
stories  
highlighting  
ways  
organizations  
across the  
country are  
implementing  
Healthy People  
2020*

## Stories from the Field

Want to know what others are doing to improve the health of their communities? Explore our *Stories from the Field* to see how communities across the Nation are implementing Healthy People 2020. You can also [share your story!](#)

Explore the map below or filter to view stories by the related topic area or Leading Health Indicator.

Sort By:

Viewing 80 results

Topic Area	Organization Name	Organization Type	Date Posted	Program State
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Filter By:

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## Healthy People 2020 in Action



Who's Leading the Leading Health Indicators? series



Stories from the Field

## Healthy People in Action

<http://www.healthypeople.gov/2020/healthy-people-in-action/Stories-from-the-Field>



# Who's Leading the Leading Health Indicators? Webinar

Healthy People  
2020

Please join us on  
**Thursday, March 22, 2018**  
**from 12:00 to 1:00 pm ET**  
for a Healthy People 2020  
*Who's Leading the Leading Health Indicators?* webinar on  
Environmental Quality  
Prevention.

Registration on  
[HealthyPeople.gov](http://HealthyPeople.gov)  
available soon



- Jennifer Villani (NIH/OD)
- Howard Hoffman (NIH/NIDCD)
- May Chiu (NIH/NIDCD)
- Chuan-Ming Li (NIH/NIDCD)
- Lonnie Lisle (NIH/NIDCD)
- Baldwin Wong (NIH/NIDCD)
- Laura Cole (NIH/NIDCD)
- Susan Dambraskas (NIH/NIDCD)
- Christa Themann (CDC/NIOSH)
- Shefa Gordon (NIH/NEI)
- Mary Frances Cotch (NIH/NEI)
- David Huang (CDC/NCHS)
- Leda Gurley (CDC/NCHS)
- Asel Ryskulova (CDC/NCHS)
- Cheryl Rose (CDC/NCHS)
- Carter Blakey (HHS/ODPHP)
- Angie McGowan (HHS/ODPHP)
- Debbie Hoyer (HHS/ODPHP)
- Ayanna Johnson (HHS/ODPHP)
- Yen Lin (HHS/ODPHP)

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