Advances in Oral Health Surveillance: CDC's Periodontitis Surveillance Project

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CDC-AAP Periodontal Disease Surveillance Workgroup

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NHANES Periodontal Examination Protocols -History

**NHANES III
1988 – 1994**

- Partial Mouth
- Two Quadrants
- **Two** sites per tooth – **64** sites per subject

**NHANES
2001 - 2004**

- Partial Mouth
- Two Quadrants
- **Three** sites per tooth – **96** sites per subject

**NHANES
2009 -2014**

- Full Mouth
- All Four Quadrants
- **Six** sites per tooth – **192** sites per subjects

Case Definitions Proposed for Population-Based Surveillance of Periodontitis

Severe Periodontitis: ≥ 2 interpromixal sites with CA loss ≥ 6 mm (not on same tooth) and ≥ 1 interproximal sites with PD > 5 mm

Moderate Periodontitis: ≥ 2 interproximal sites with CA loss ≥ 4 mm (not on same tooth); OR ≥ 2 interproximal sites with PD > 5 mm (not on same tooth)

Mild Periodontitis: ≥ 2 interproximal sites with ≥ 3mm CA loss, and ≥ 2 interproximal sites with ≥ 4 mm pocket depth (not on same tooth) or 1 site with ≥ 5 mm PD

**No Periodontitis :** No evidence of mild, moderate or severe periodontitis

Page RC and PI. Eke[†] Case Definitions for Use in Population-Based Surveillance of Periodontitis. **Journal of Periodontology** July 2007, Vol. 78, No. 7s, Pages 1387-1399

Eke PI, RC Page, L Wei, G Thornton-Evans, RJ. Genco. Update of the Case Definitions for Population-Based Surveillance of Periodontitis. **Journal of Periodontology**; March.2012

NHANES 2009 - 2010

- Stratified multistage probability sample of the civilian non-institutionalized U.S. population
- ≥30 years old
- Exams by dental hygienist in the Mobile Examination Center (MEC)
- Recorded gingival recession and pocket depth
- Six sites per tooth on all tooth (except third molars)
- No Bleeding on Probing (BOP) assessed
- 3743 completed exams
- Representing weighted population of 137.1 million
- First time use of the FMPE protocol in NHANES

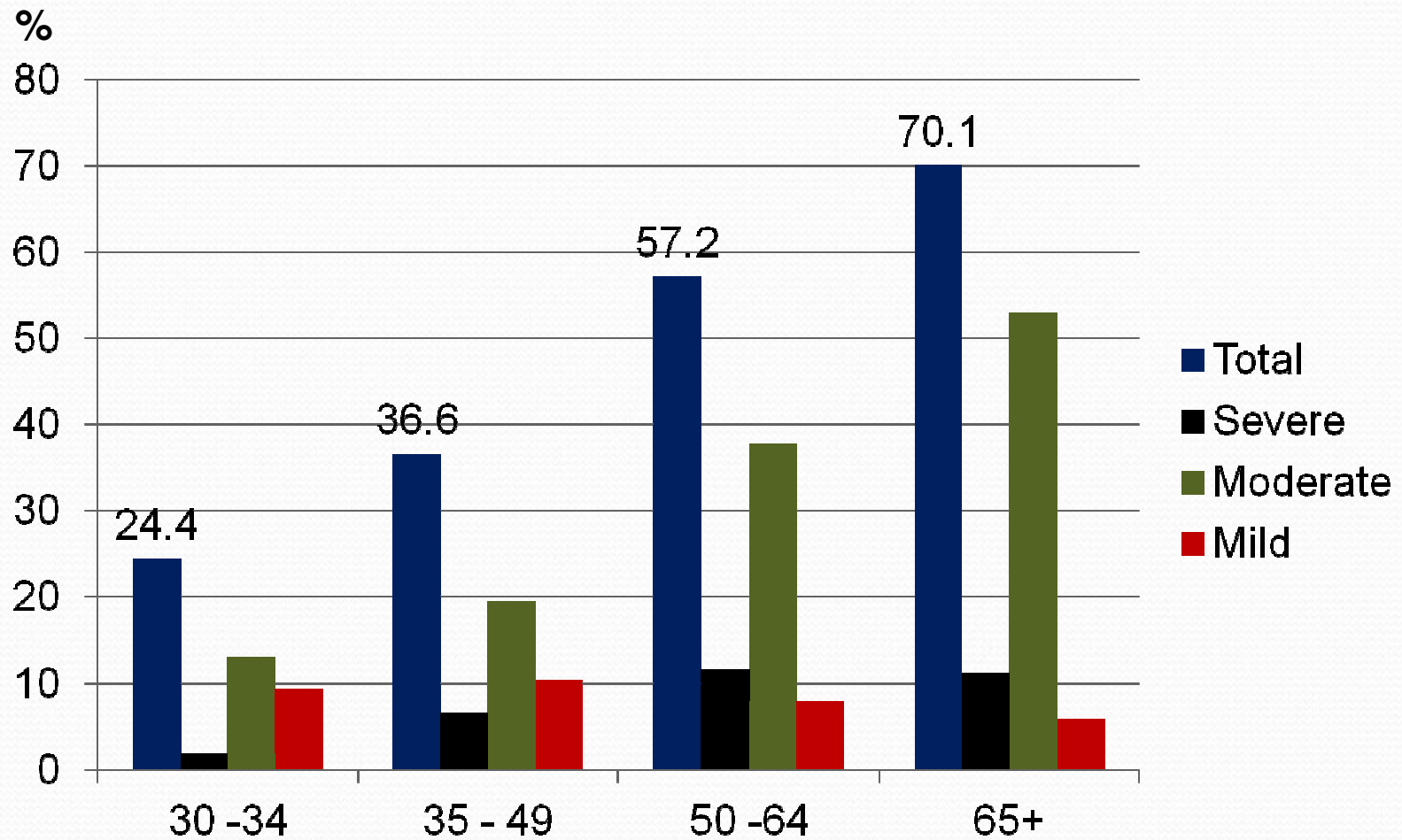# Prevalence of Periodontitis in U.S. Adults ≥ 30 years
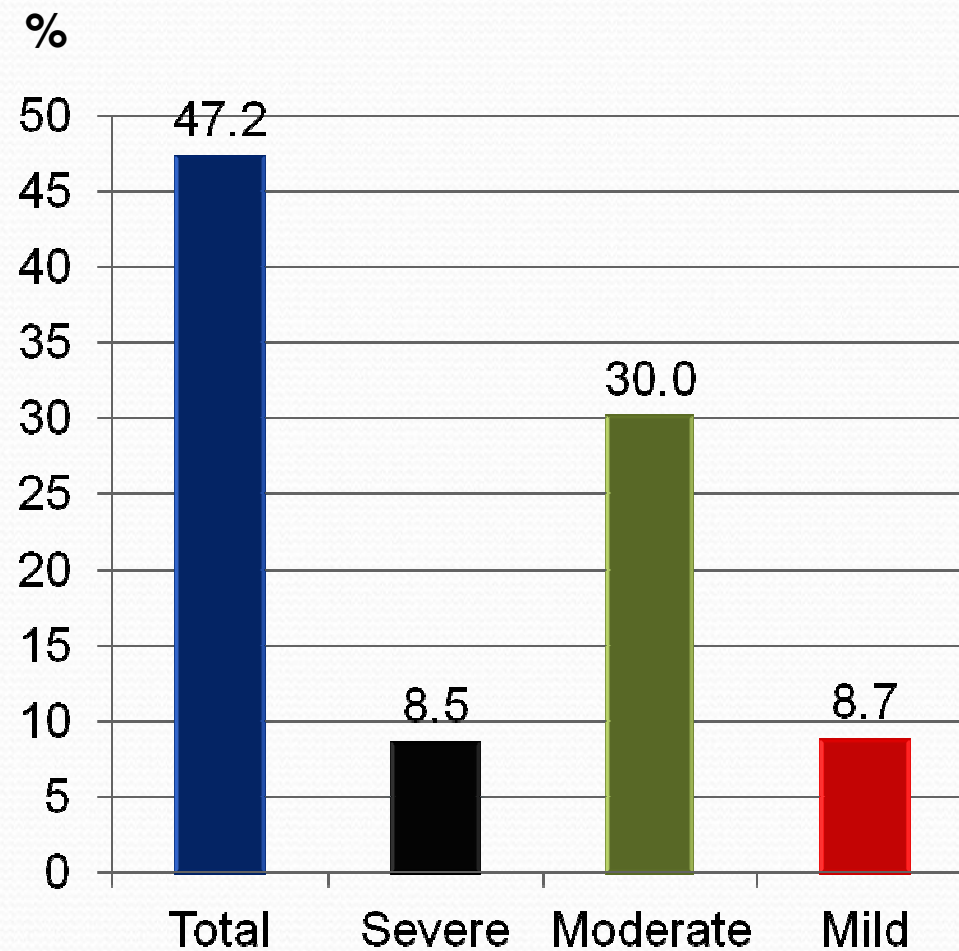
Prevalence: Full Mouth Examination Protocol (FMEP) *vs.* Partial Mouth Examination Protocols (PMEP)
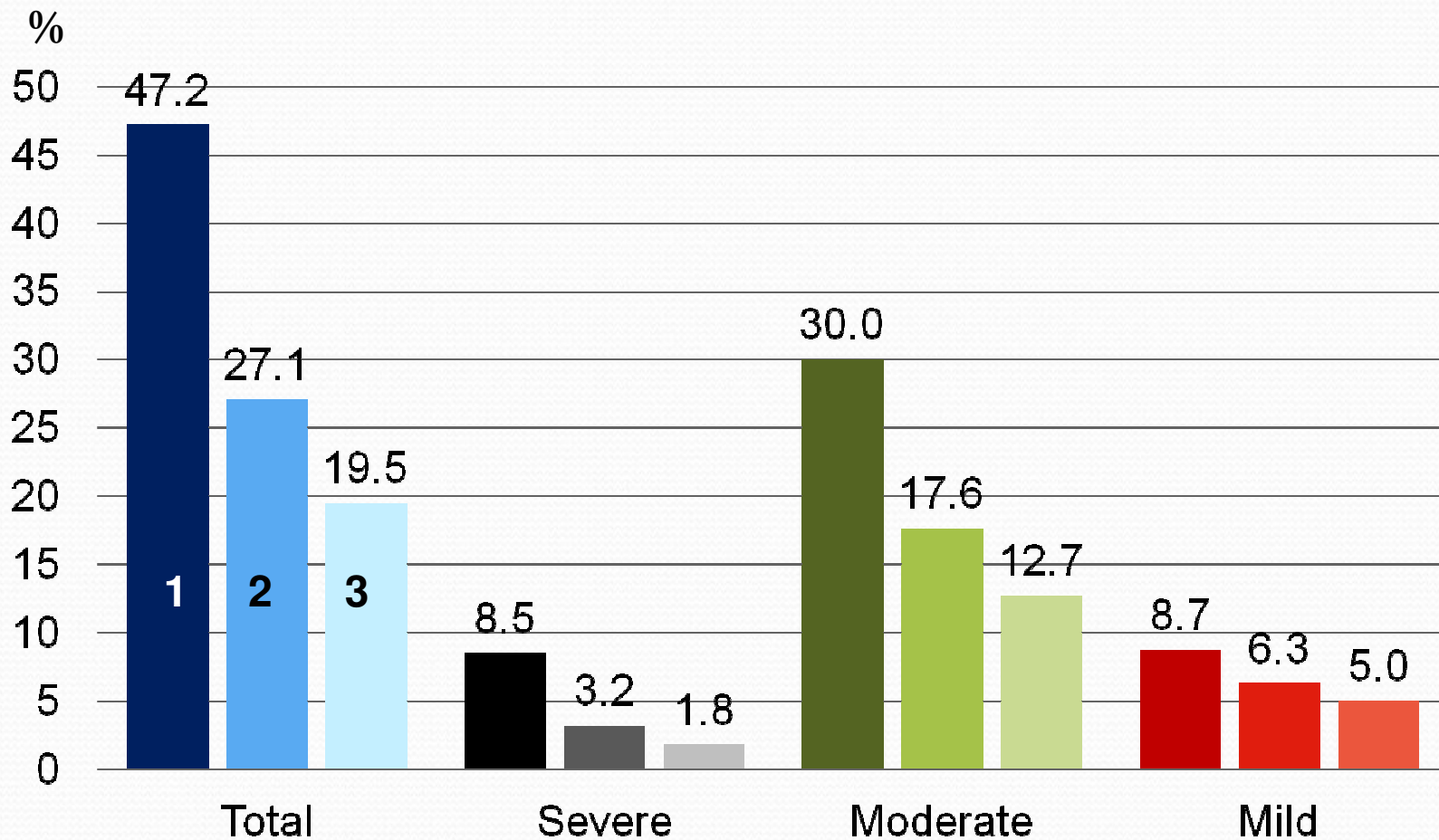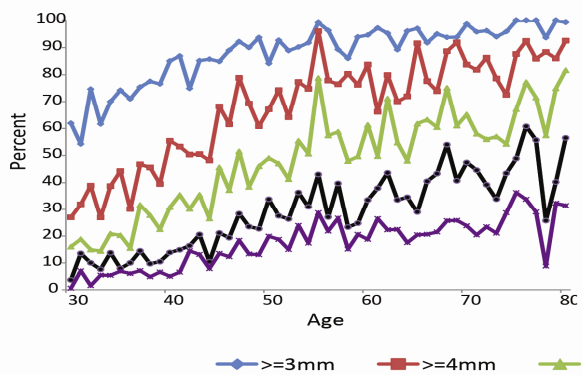
(1) NHANES 09-10 FMEP (2) NHANES 00-04 PMEP (3) NHANES III PMEP
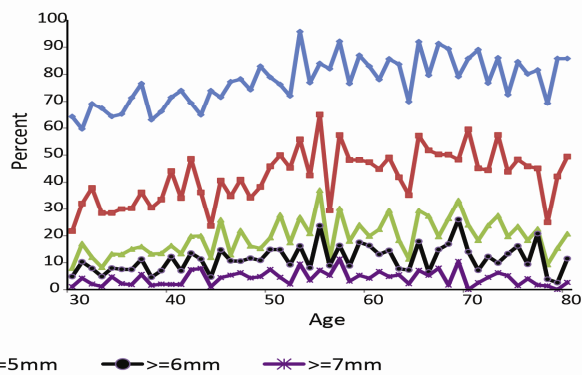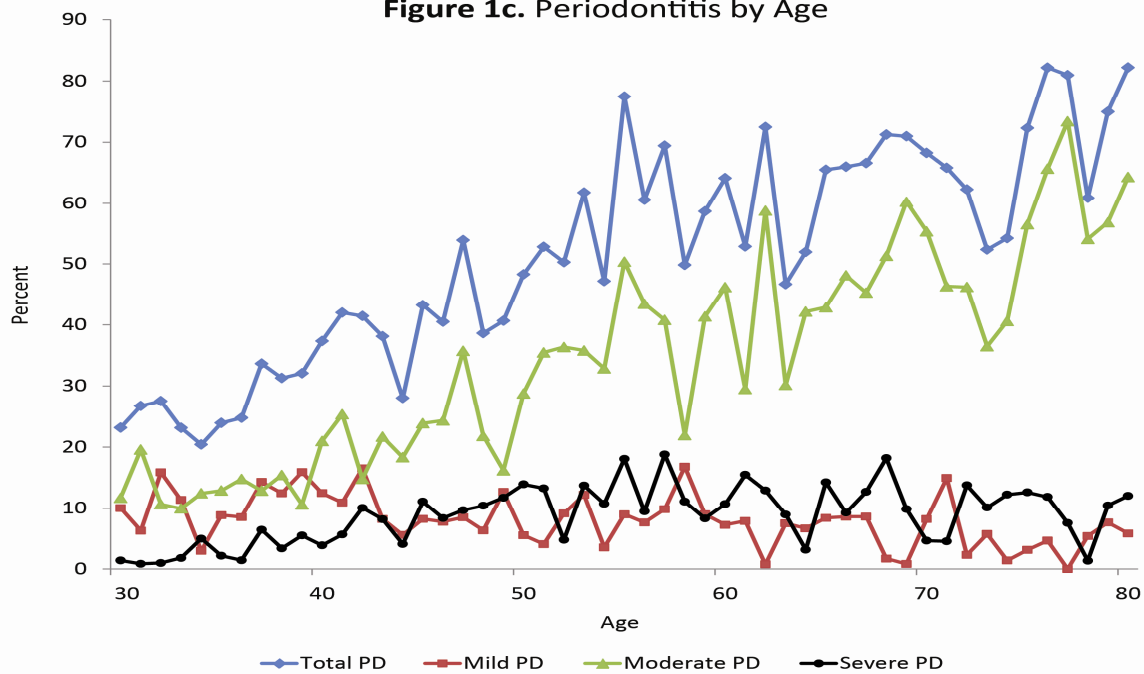
Prevalence of Periodontitis by Age Groups

Figure 1a. Percentage of Attachment Loss by Age
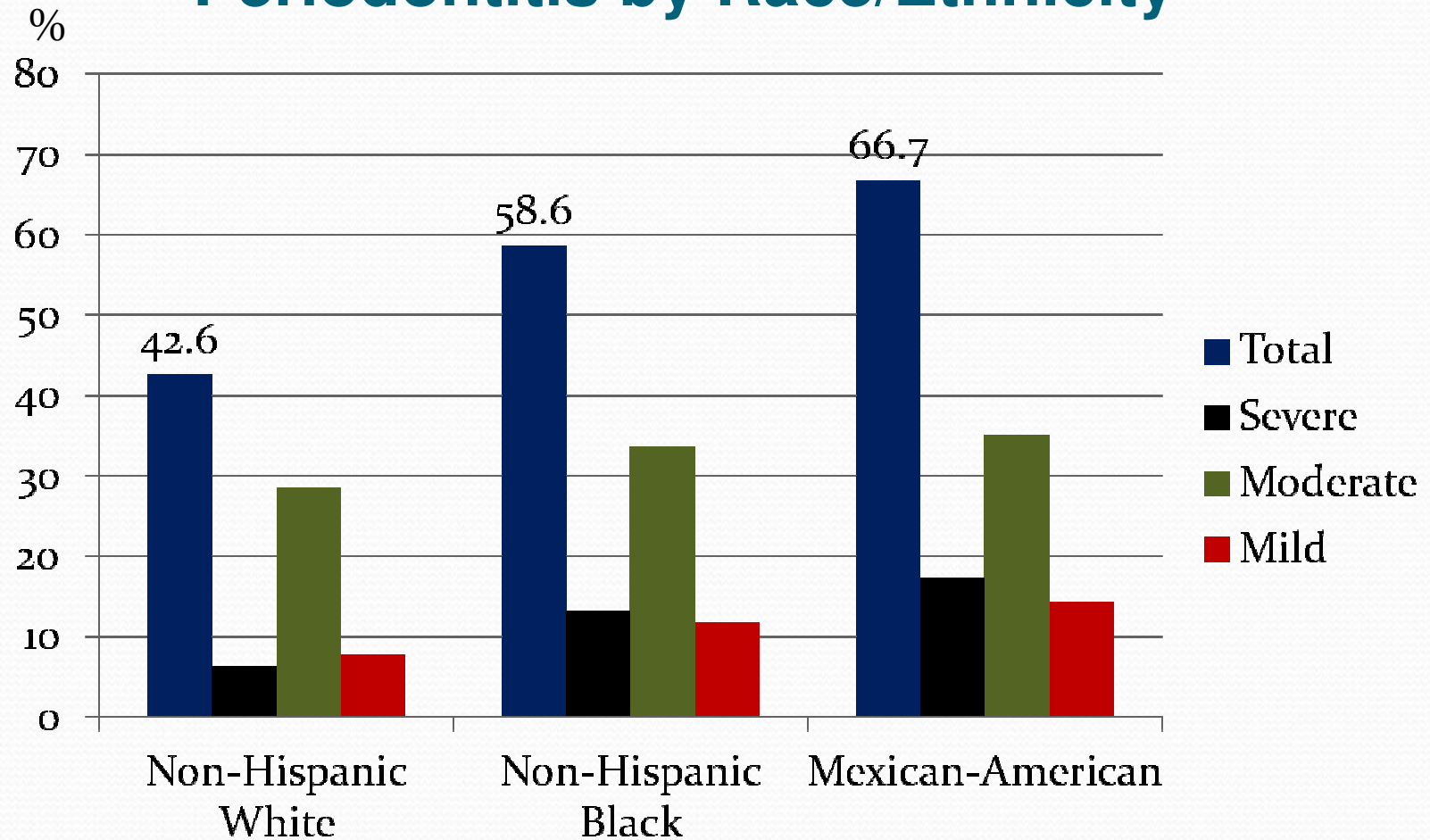
Figure 1b. Percentage of Probing Depth by Age

Legend: >=3mm, >=4mm, >=5mm, >=6mm, >=7mm

Figure 1c. Periodontitis by Age

Legend: Total PD, Mild PD, Moderate PD, Severe PD

Periodontitis by Race/Ethnicity

Periodontitis by Poverty Levels

%

- 65.4
- 57.4
- 50.2
- 35.4

Legend:
- Total
- Severe
- Moderate
- Mild

X-axis: < 100 FPL, 100 – 199% FPL, 200 – 399% FPL, > 400% FPL
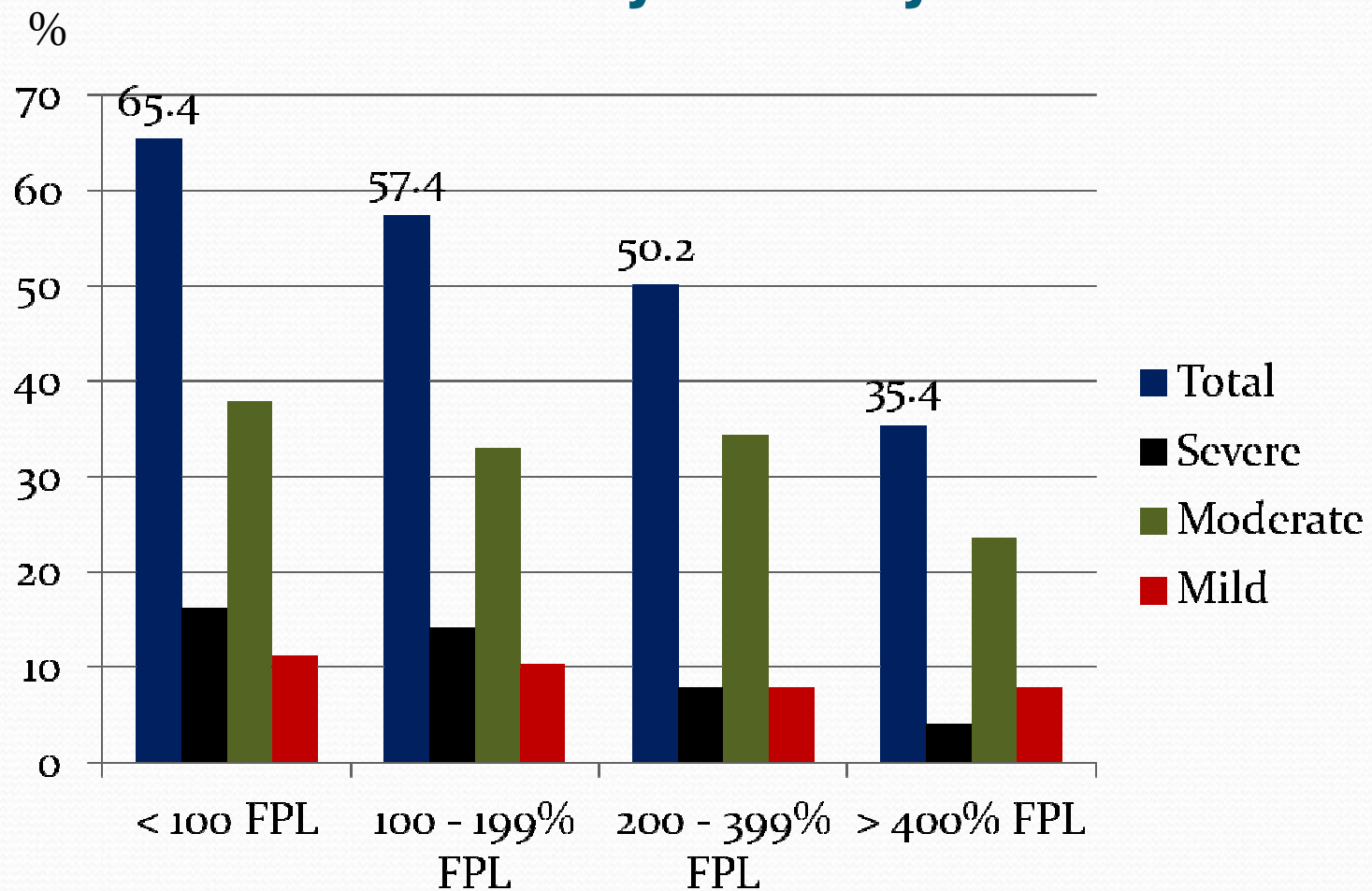
Periodontitis by Smoking Status
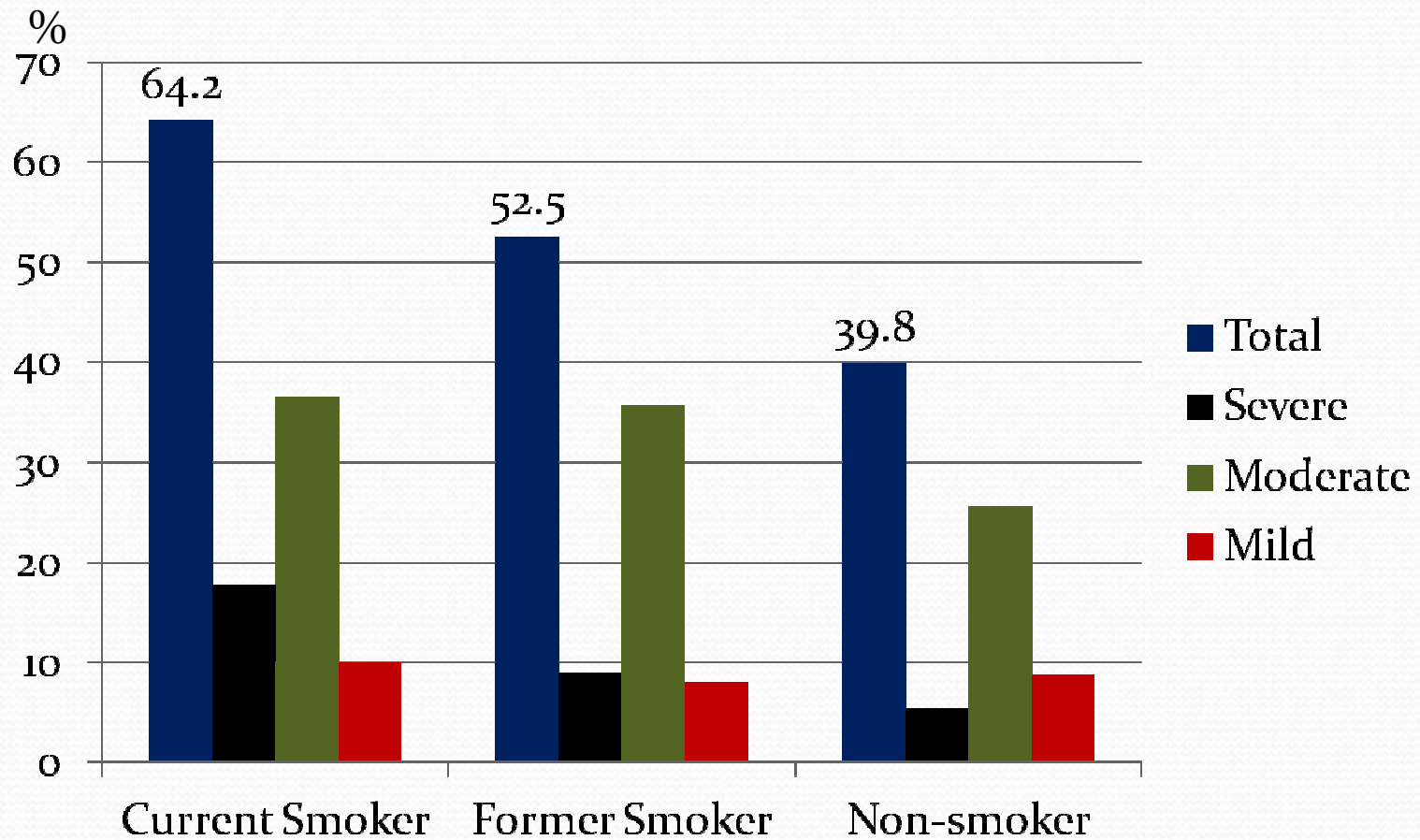
Self-Report Measures for Surveillance of Periodontitis: Progress Update

- Collaboration between CDC, the American Academy of Periodontology (AAP). and subject matter experts in academic settings since 2003.
- Completed systematic literature review.
- Identified potential questions based on analyses of surveys that utilized self-report questions to assess periodontitis.
- Developed standard cases definition for surveillance of periodontitis.
- Completed cognitive testing of the questions in U.S. adults.
- Pilot tested questions in Australian adult population.
- Pre-tested question in a convenience sample of U.S. adults.
- Validation of questions versus clinical cases of periodontitis in a representative U. S. adult population (NHANES 2009 – 2010).
- Manuscript on the findings from NHANES 2009/2010 in final stages.

Self-report Questions

1. Gum disease is a common problem with the mouth. People with gum disease might have swollen gums, receding gums, sore or infected gums or loose teeth. {Do you/Does SP} think {you/s/he} might have gum disease?

2. Overall, how would {you/SP} rate the health of {your/his/her} teeth and gums?

3. {Have you/Has SP} ever had treatment for gum disease such as scaling and root planning, sometimes called deep cleaning?

4. {Have you/Has SP} ever had any teeth become loose on their own, without an injury

5. {Have you/Has SP} ever been told by a dental professional that {you/s/he} lost bone around {your/his/her} teeth?

6. During the past three months, {have you/has SP} noticed a tooth that doesn't look right?

7. Aside from brushing {your/his/her} teeth with a toothbrush, in the last seven days, how many days did {you/SP} use dental floss or any other device to clean between {your/his/her} teeth?

8. Aside from brushing {your/his/her} teeth with a toothbrush, in the last seven days, how many days did {you/SP} use mouthwash or other dental rinse product that {you use/s/he uses} to treat dental disease or dental problems?

Preliminary Findings – NHANES 2009/10

		Total Periodontitis	CAL $\geq$ 3 mm	PD $\geq$ 4 mm
# of questions		5	4	5
Sensitivity		85%	94%	76%
Specificity		58%	31%	58%
ROC		0.81	0.82	0.75

ROC curve for periodontal diseases
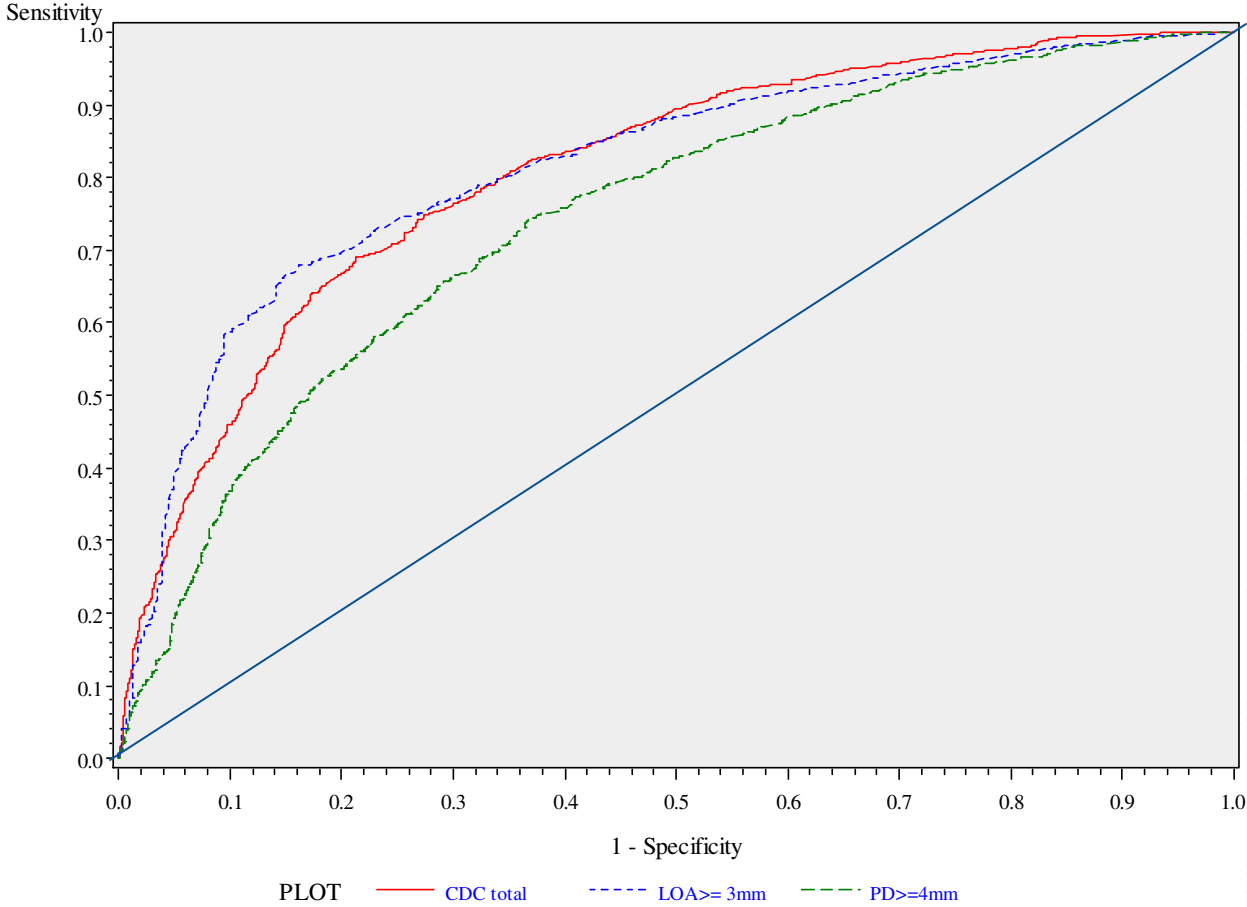
CONCLUSION

- 1st time: Direct evidence for high burden of PD
- Moderate PD increases with age
- Severe & mild PD remain< 15% across all ages
- Disparities by SES and race/ethnicity
- Important implications for aging US population
- Data collection continues to 2014
- Self-report questions are promising based on NHANES 2009/2010 data.

Thank You