



Integrated Pest Management - A Simple Solution to Problem Pests in Elderly and Disabled Public Housing



Integrated Pest Management Team

2

Making life healthier and happier where people

live



learn

heal



Pests pester



3

Human ectoparasites

4



Just want to kill them

5



Subsidized housing

6



Arizona inner-city - public housing

7

- Residents 62+ senior and/or disabled
- Independent living
- Per-Capita Income by zip code 2017

(1)	(2)	(3)	(4)	(5)	County
43K	9.6K	12K	11.4K	29K	→ 27.8K

Rent: 30% of adjusted annual income or 10% of gross

Dedicated staff and upper management teams

8



Ecological approach

9





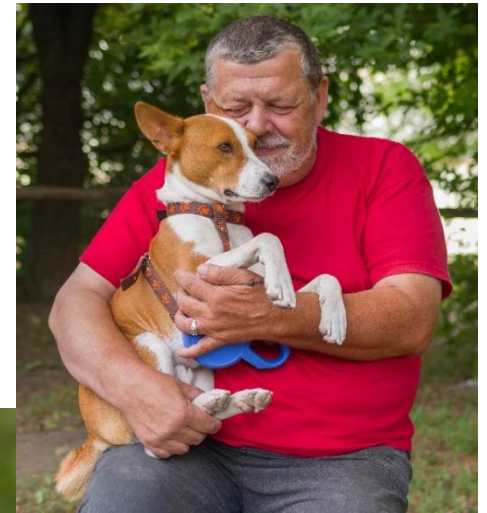
10



Pest incidence &

11

- ❑ Per-capita income
- ❑ Sanitation and clutter scores
- ❑ Gender identity
- ❑ Smokers
- ❑ Pet owners
- ❑ Physical disability
- ❑ OTC pesticide use



**Elderly and/or disabled multiunit,
– 612 apartments**



**We are here to get rid of the
bed bugs and cockroaches**

We didn't attempt to change the way people live

13



*We are
going to
make life
easier for
you!*

Whole-building assessments



WELCOME!

Some of the most useful things you get from whole-building inspections

15

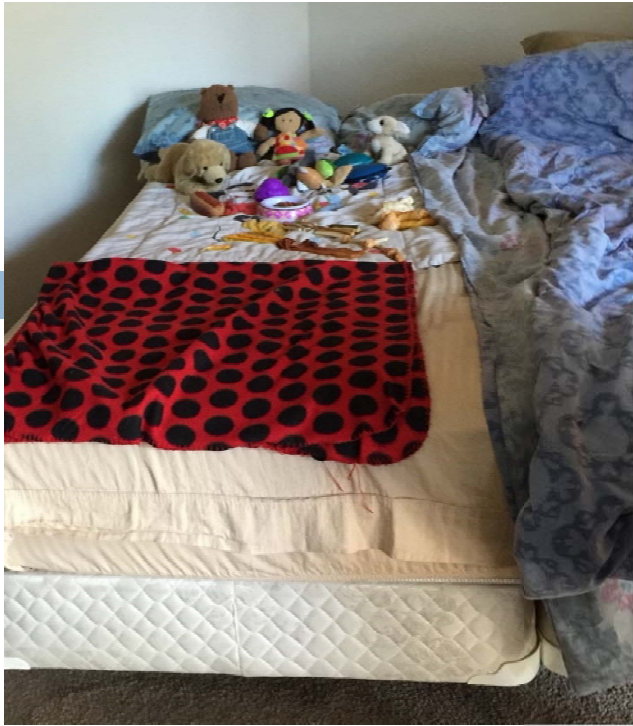
- You get to know people and understand their limitations
- You actually know what's going on, and where – imagine that!
- You can show that **even the cleanest apartments have cockroaches** when building levels are high
- **You get to show you care**

German cockroaches *Blattella germanica*

16

- 1.7-100% of units had cockroaches





B&G Lo Line Cockroach Traps

18



Bed bugs

Cimex lectularius

19

- 1.7-15% of units had bed bugs



Some severe bite reactions

20



SenSci ActivVolcano

21



Pesticides applied by residents

22

- Retail (OTC & internet), illicit, outdoor only, and legacy
- 32-60% units has pesticide products



Wide range of pesticide classes

23

- ❑ Pyrethrins/pyrethroid
- ❑ Phenylpyrazole
- ❑ Borates
- ❑ Diatomaceous earth/silica
- ❑ Amidinohydrazone
- ❑ Organophosphates
- ❑ Carbamates
- ❑ Second generation anticoagulant



Pesticides applied by residents

24

- ❑ Off-label
- ❑ Excessive
- ❑ No Personal Protective Equipment
- ❑ Hazardous material cleanup (\$5K)



Pesticide residues in 8 units – kitchen floor swab samples



25

- ❑ Cockroach bait products could not be detected
- ❑ Volatile vapor products were detected
- ❑ Not all white powder was Diatomaceous Earth
- ❑ Presence doesn't always mean use



Popular products

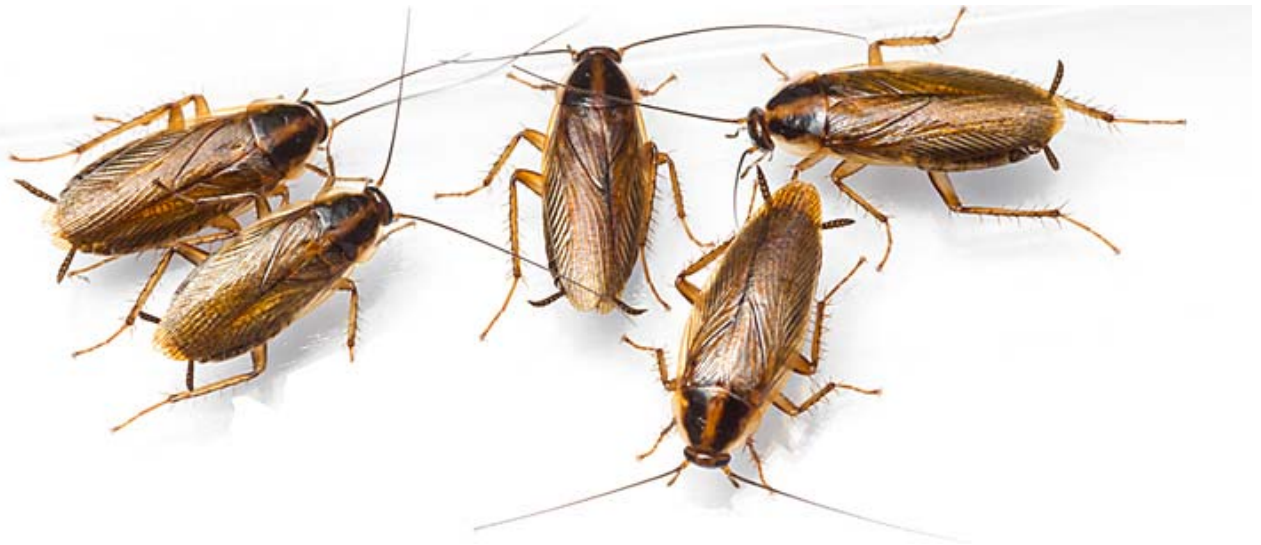
26



Let's get rid of the cockroaches

27

- Rotation of fipronil (phenylpyrazole) and dinotefuran (neonicotinoid) bait
- Policies regarding waste disposal
- In-home help
- Vacuuming



Let's get rid of the bed bugs

28

- Service protocol to include:
wall void CimeXa,
rotation of dual MOA
(pyrethroid +
neonicotinoid),
vacuum, dryer use



Residents

29

- ❑ Wheelchair, scooter, walker enabled
- ❑ Cardiovascular disease
- ❑ Diabetes mellitus
- ❑ Cancer
- ❑ Legally blind
- ❑ Hearing impaired
- ❑ Stroke
- ❑ Psychiatric



Common sense

30

- ❑ No sanitation or clutter improvements
- ❑ It made no sense to ask residents to undertake extensive prep



IPM

- Education/communication
- Monitoring/evaluation
- Rotation of German cockroach gel baits
- Policy to empty garbage when resident is absent
- Dumpster etiquette (no diving or dragging)
- Dual action crack and crevice bed bug sprays & CimeXa dust
- **Vacuuming**
- Laundering (or drying)
- Encasements



□ Education/communication

□ Monitoring/evaluation

□ Rotation of German cockroaches

□ Policy to empty garbage
hospitalized or

□ Dumpster

□ D-

**No extensive resident
preparation!!!!**

IPM

rice bed bug sprays

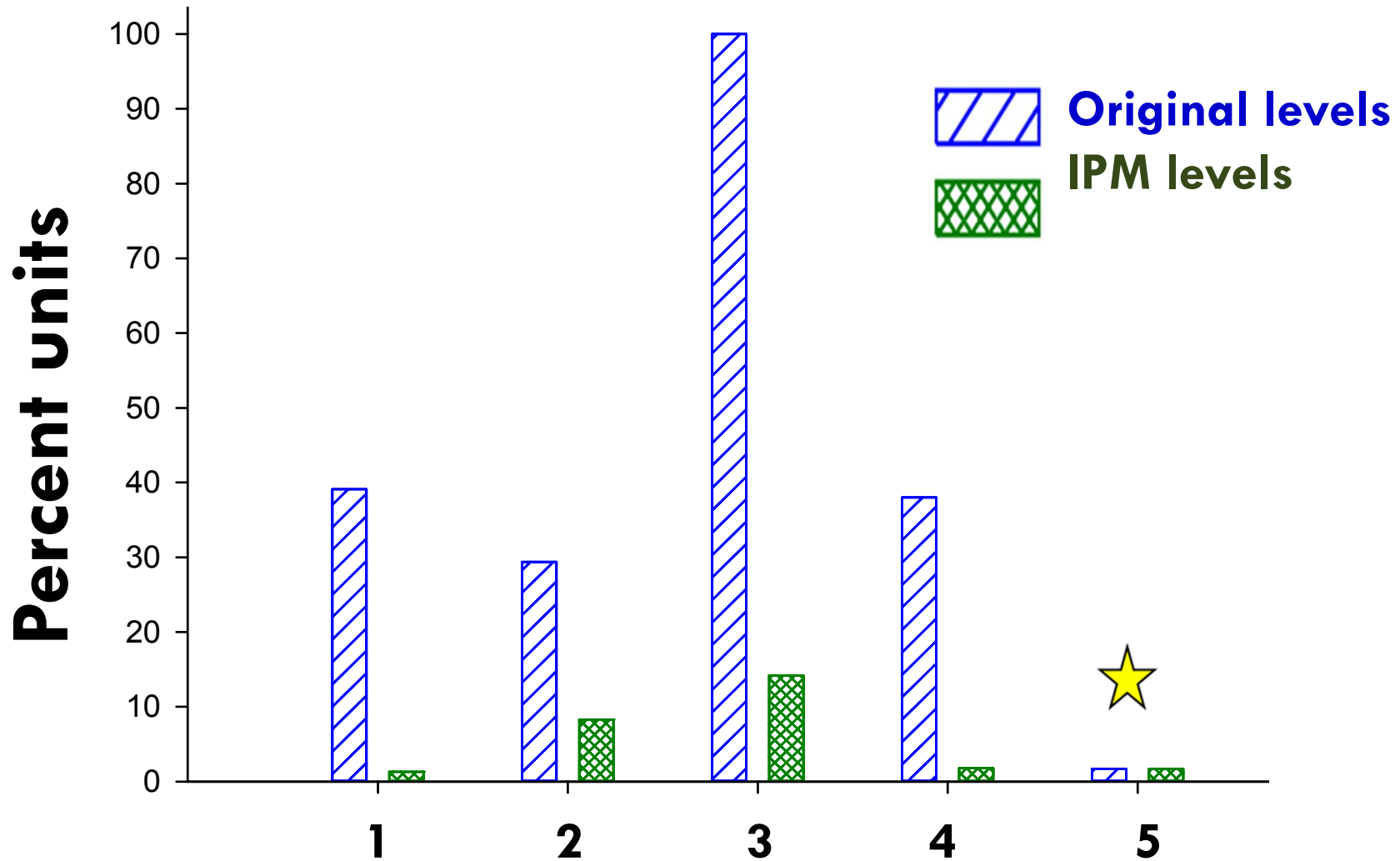
er (or drying)

□ Encasements



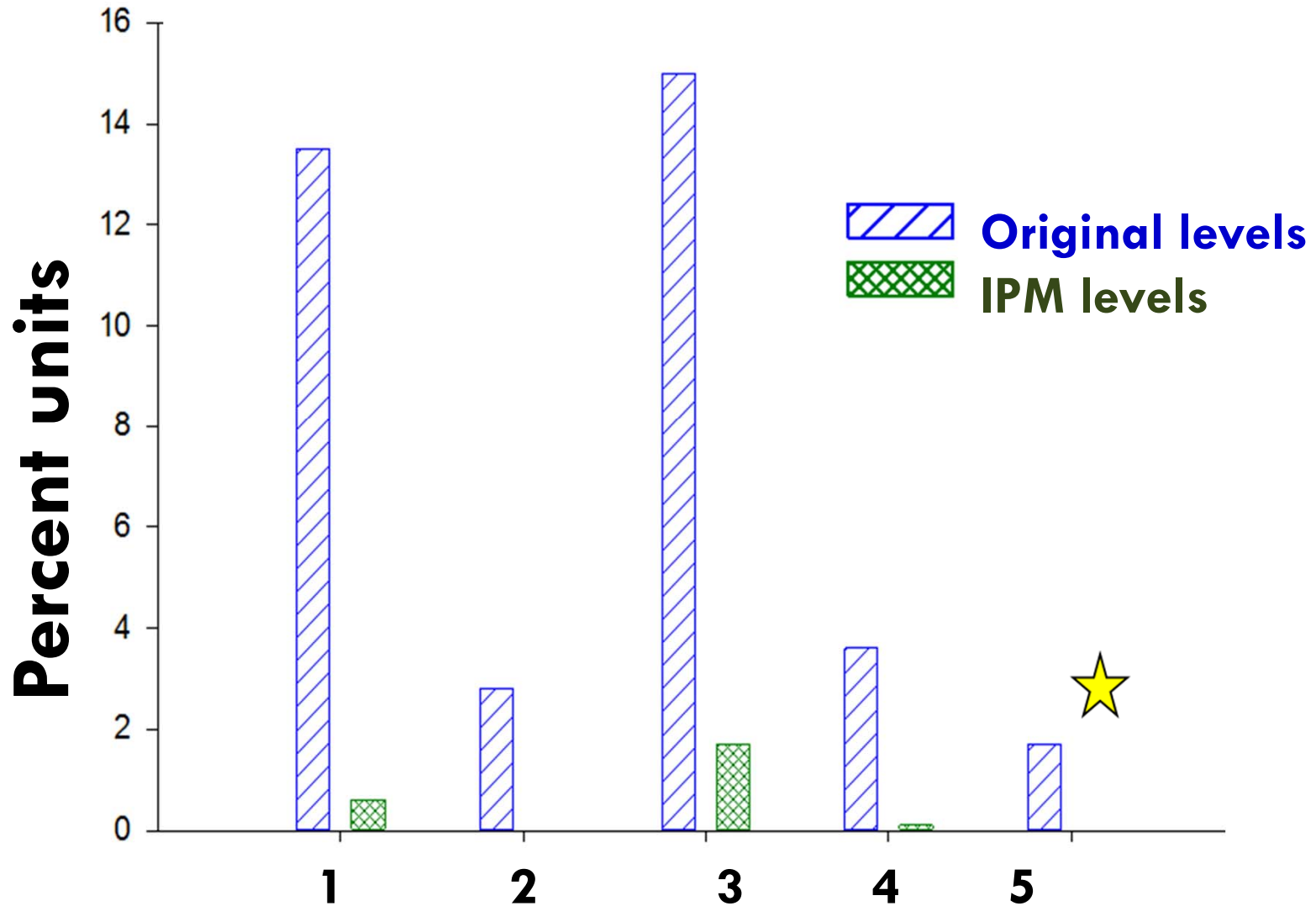
87% reduction in German cockroaches - action threshold = 1

33



93% reduction in bed bugs - action threshold = 1

34

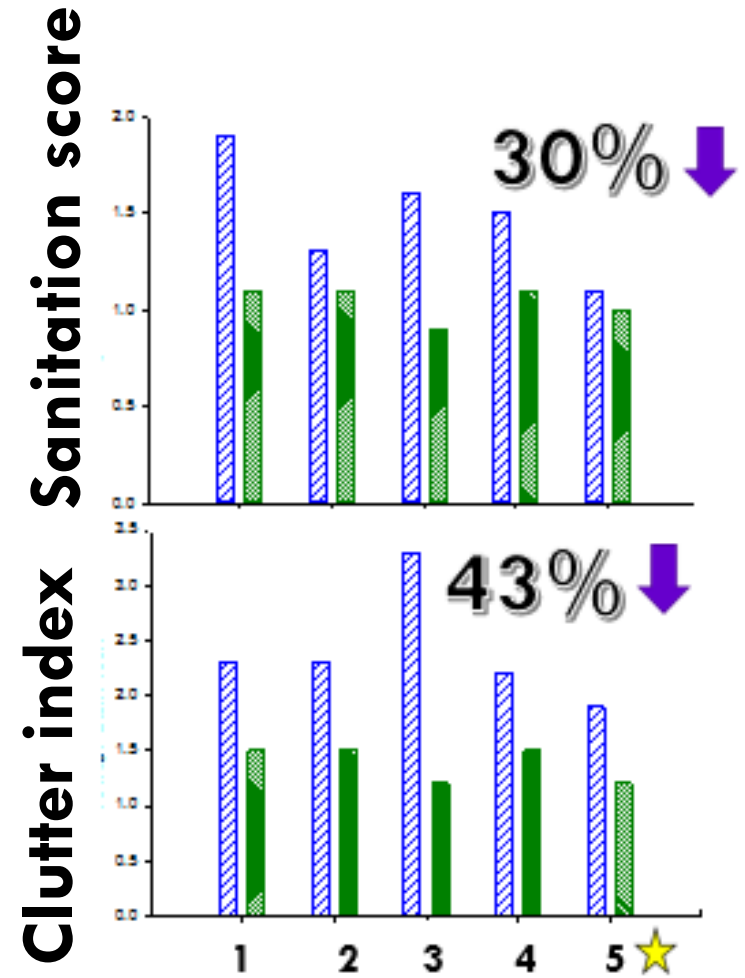


Sanitation standards improved and clutter levels reduced

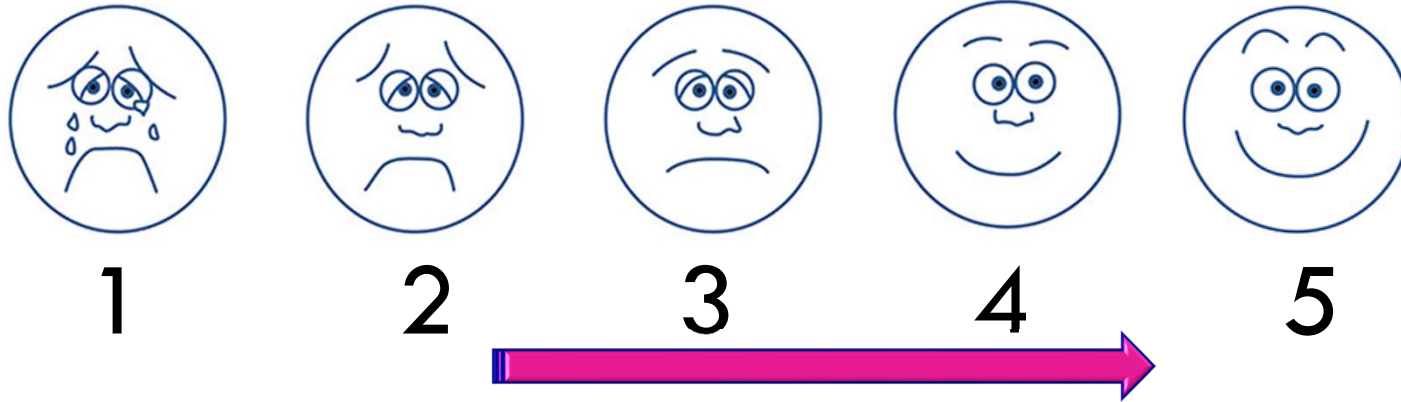
35



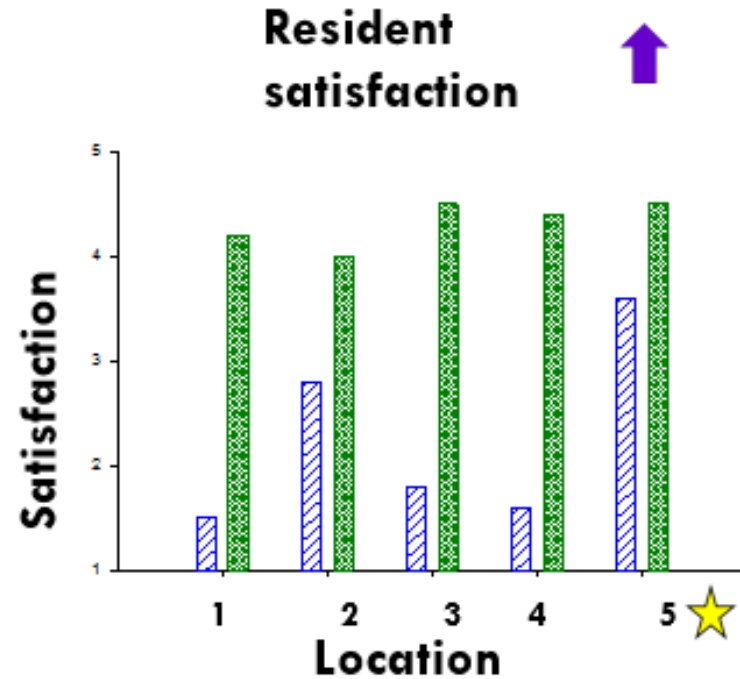
 Original score
 IPM score



Improved satisfaction



 **Original levels**
 **IPM levels**



Summary

37

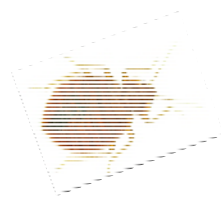
- Only low level bed bugs still persisting in very few units (1-20 live bugs)
- Only low level German cockroaches still persisting in some units (1-20 live bugs)
- Living conditions improved



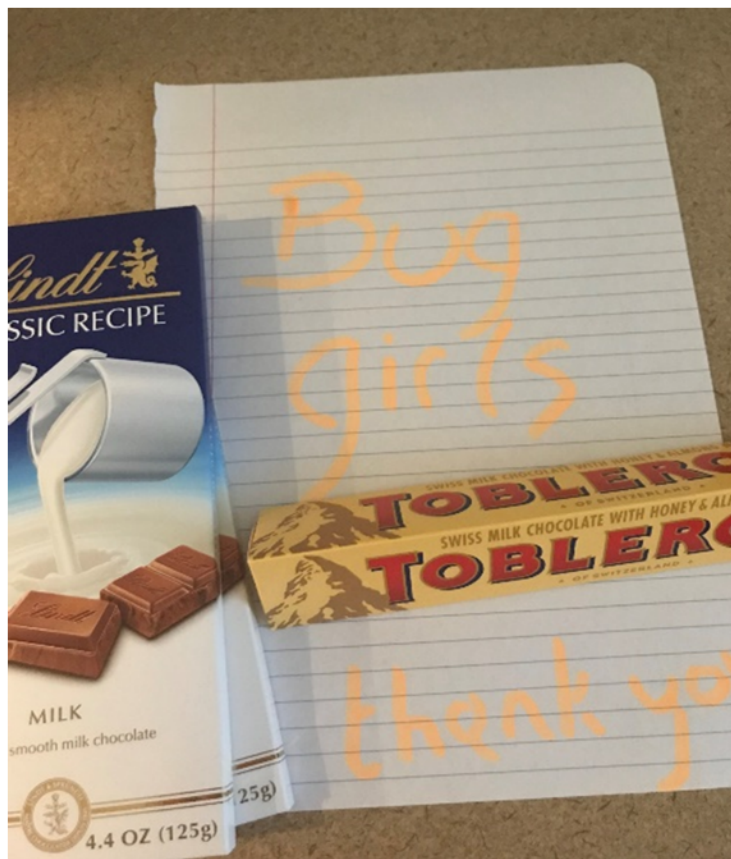
87%



93%



THANK YOU



Let's get real

- Residents likely to change their living habits in minor ways only
- We did not and were not trying to reduce costs (initial costs were \$0.78/month/unit)
- Pest management service visits taking under 2 minutes/unit
????????????????????????????????



More reality

40

- Preparation list madness and “insufficient prep” walk-by is a recipe for disaster
- Construction and remodeling reveals pest resources
- Getting control of infestations can take **months to years**
- **We hope that researchers will focus on affordable heat treatments taking a building-wide approach**

Our advances in knowledge and technology can be used to uphold standards of housing synonymous with civility, compassion and justice



Final thoughts for public housing

59

By 2020, 1 in 6
Americans will be
65 or older



You can manage pests

Residents are a part of solutions waiting to happen

Cost effective pest management is worth it

Appropriate contract specifics are essential

Contractor oversight, and continuous evaluation is essential

Our thanks:



**>680 residents who shared their homes,
housing teams who trusted us,
pest control company who accepted guidance,
USDA-NIFA (ARDP & EIP) who invested in us,
Bed Bug Central for consumables,
B&G Equipment Company for consumables,
Arizona Division of Pest Management for muscle,
Carrie Foss – Washington State University,
Tim Stock – Oregon State University,
Rachel Riley (HUD),
Western Region Bed Bug Work Group,
Arizona Pest Management Center,
**Robert LaMorte &
Annaka Gouge-Smith,
Padmanand Madhavan Nambiar,
Alfred Fournier & Deanna Li-Fournier
Naomi Pier****