HEALTHY FUTURE ARIZONA

ACHIEVING A HEALTHY FUTURE FOR OUR CHILDREN, OUR SCHOOLS & OUR STATE

Contact: Scott Turner scott.turner@edunuity.org 602-513-0028

Edunuity

08/01/2017

Win-Win Agenda

(Overview)

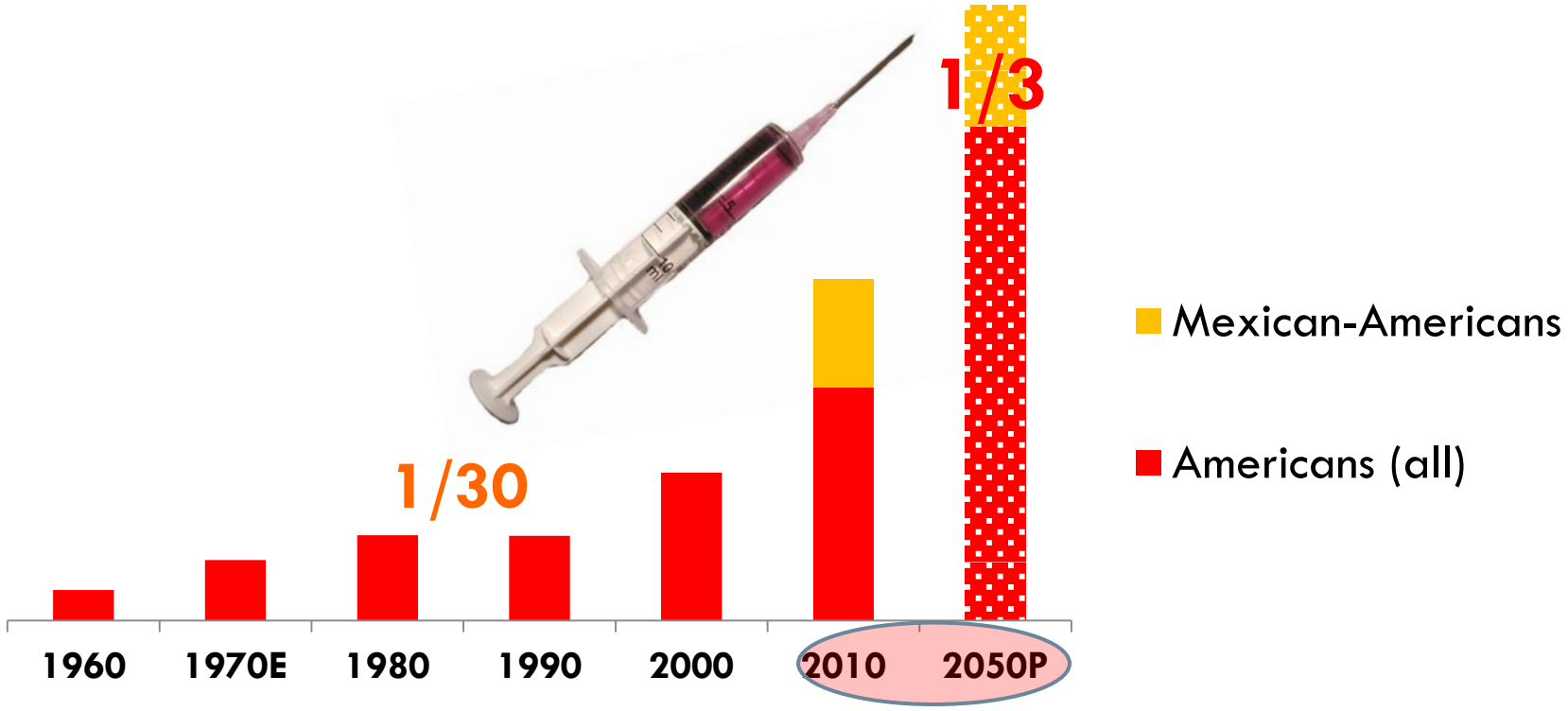
Prevent 1/3 Children → Diabetic Adults

With Proven Programs & Policies K-12

& Use Savings to Help Fund Education

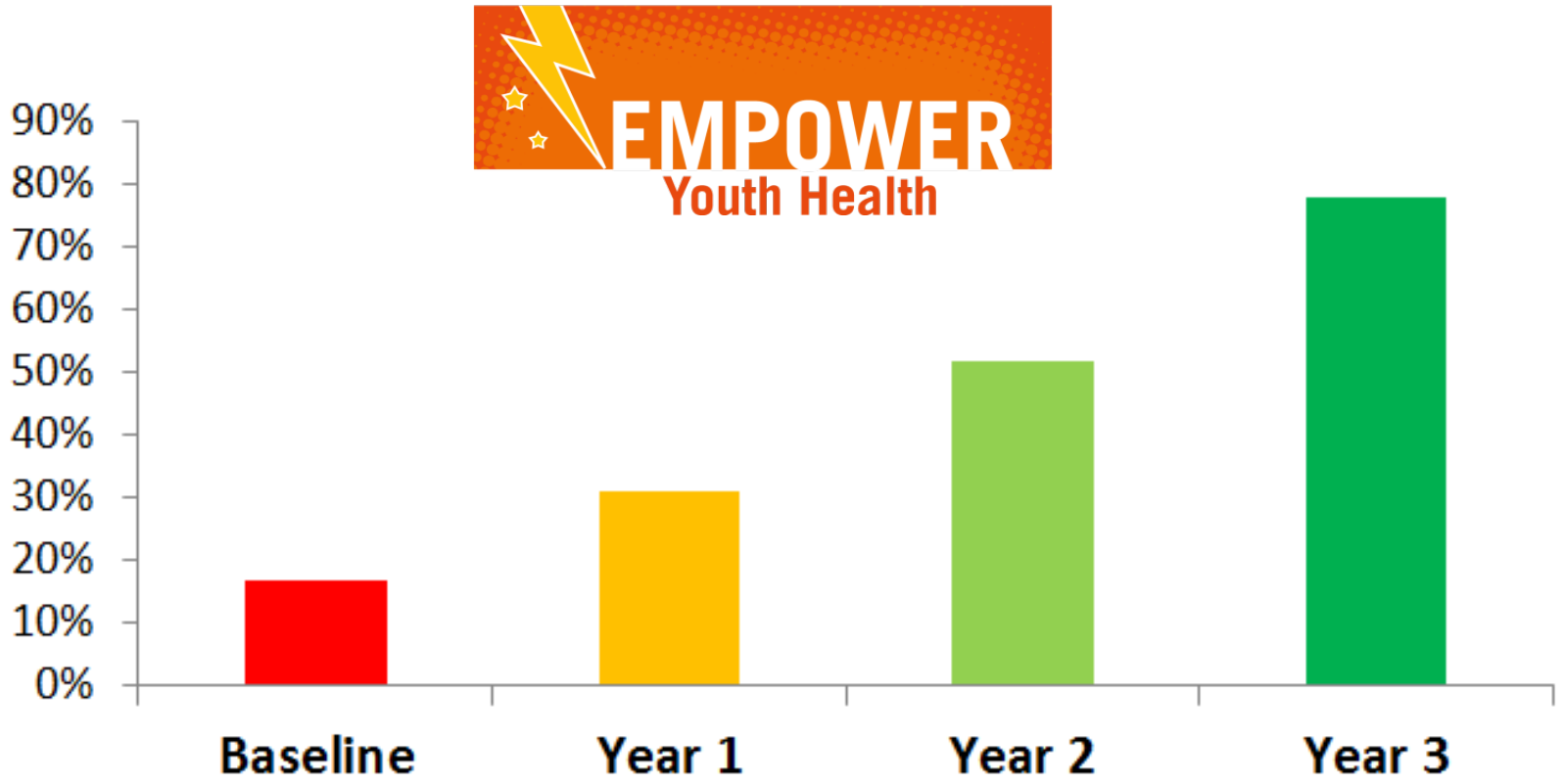
Notes: Google images: MindFreedom, School Book. Slide @07/31/2017

What if Your Child = 1/3 chance of Diabetes?



Notes: 23% teens, 35% of adults pre-diabetic: 86M/243M adults. Approaching 500,000 w/diabetes in AZ now. Much higher-than-average diabetes rates among Mexican-American, Native-American, & lower-income populations. Diagnosed + undiagnosed diabetes, prevalence% of US population calculated using same diag./undiag. ratio as in 2010. $245B = USA diabetes costs 2012, 41% increase in 5 years, & still growing fast. Annual medical expenditures per nonelderly (ages 18-64) adult enrollee in Medicaid, 2009: No chronic conditions=$4,342/year; CVD (cardiovascular disease) =$9,414/yr; Diabetes=$13,313/year; after out-of-pocket costs; per Kaiser FF. References: *Pediatrics*, 2012 in USNews, 5/21/2012 (youth prediabetes); Diabetes. org (adults; USA); Boyle et al, 2010 ("middle-ground projections); CDC, 2014: *Long-term Trends in Diabetes*; Schneiderman et al, 2014; other estimates & details @edunuity.org. Google image: MindFreedom Slide@08/01/2017

High Teen Fitness =
>50% Less Diabetes



Notes: Empower Youth Health Program (EYHP) results from very-low-income AZ schools; 90% Hispanic, 5% Native-American, 3% White, 2% African-American. By Year 3: 20 schools in EYHP, 16,000 students, Sunnyside USD, Tucson; **increased % students with cardio-vascular aerobic fitness 4x from 17% to 78%; >6x increase in % of students with good nutrition: 11% → 73%** consuming recommended fruit & vegetable servings; **% of students at normal weight increased by 12.5% from 48% to 54%**. Measured by objective aerobic capacity (PACER), BMI, & muscular strength & endurance metrics, + CDC-validated nutrition questions. References: Reeves, 2016: *US Department of Education Grant Performance Report (ED 524B)*: Jennifer Reeves, Associate Research Scientist, UofA, Principal Investigator; fall 2012 - spring 2015. Crump, Sundquist, et al, 2016: *Physical fitness among Swedish military conscripts and long-term risk for type 2 diabetes mellitus*: "These findings suggest that interventions to improve aerobic and muscle fitness levels early in life could help reduce risk for type 2 diabetes mellitus in adulthood." [1/2 - 2/3 reduced risk] Other details @edunuity.org Slide@08/01/2017

Health / K-12 Win-Win

$1M/year ← N.Az. Healthcare: K-8 physical activity (since 2012)

→ **Child obesity ½ as likely***

→ **$60-90/student/year health cost savings**

→ ***If statewide* >$100M/year new money for K-12**

Note: $1M/yr from Northern Arizona Healthcare, since 2012 =~$100/student/yr invested in PA, etc. in 20 elementary/middle schools, 5 districts, >9000 students/year in greater Flagstaff+. *50% reduction in the incidence of being overweight from what would be expected based upon school district data. Physical activity program cost of $60-70/student/year. Evidence-based evaluation: *2350 children, 4x BMI measurements over first 2 years.* Mandatory 1 class/week moderate-to-vigorous physical activity (MVPA) & nutrition ed, led by trained Health Aides. Based on 7.5-10% of students not being obese, who would have otherwise been obese @$600 health cost/obese student/year, NAH is estimated to be saving $45-60/student/year in obesity-related costs alone; ADHD/asthma/depression & other mental health savings associated with moderate-to-vigorous physical activity could add savings of up to $30-50/student/year. Fit Kids physical activity programs in K-8 schools cost approx. $60-70/student/year = primarily cost of trained health aide to lead physical activity (PA). References: Child obesity health costs: Buescher et al, 2008; Hampl et al, 2007; Kuhle et al, 2011; see MVPA-related annual child health cost savings slides for detailed references. Fit Kids evaluation reports (DeHeer, 2014) & emails with NAU Prof. DeHeer; Fit Kids website: https://nahealth.com/fit-kids; Fit Kids staff/board member. Edunuity total cost savings estimates. Google images: clipartfest, School Book . Slide@08/01/2017

HFA Coalition

Healthy Future US/Arizona

Education, health, public-private, statewide **coalition** to dramatically improve health in AZ

Scott Turner, CEO & Co-founder, PhD, MA, MBA. Business exec, 30 years; giving back *pro bono* last 7 years; Board, Social Venture Partners Arizona; Board, Arizona Business & Education Coalition (ABEC); ADHS AzHIP Obesity & School Workgroups

Arizona Health & Physical Education

AZHPE, established 1931, is Arizona affiliate of SHAPE America (the national **S**ociety of **H**ealth **A**nd **P**hysical **E**ducators)

Close to **1000 members**, representing **~2600 certified** physical & health educators of AZ

Hans van der Mars, PhD. Professor & Program Director, PE Teacher Ed & MPE Programs, ASU; AZHPE Director of Advocacy; >60 papers/book chapters/textbooks; Boards, SHAPE America & President's Council on Fitness, Sport & Nutrition Science

Empower Youth Health Program (EYHP)

Highly effective, nationally recognized **program** that substantially improves PE, PA, fitness, nutrition ed @$10/student/year

EYH State Leadership team:

Jason Gillette, Chief, Office of Tobacco Prevention, Cessation & Secondhand Smoke, ADHS; former School Health Director, ADE (3 years). Co-Chair, Arizona Cancer Coalition.

Jen Reeves, MEd. Associate Research Scientist, UofA (18 years): >$200M in grants; Principal Investigator, EYH; former PE teacher, Avondale, Tucson (20 years); Spanish-speaking; national SHAPE America Award

Keri Schoeff, Physical Education/Physical Activity Coordinator, ADE (5 years); former PE Teacher, Dysart USD; Glendale Union HSD (14 years)

Scott Turner

Arizonans for Recess

Advocating for more recess time and better recess policies & practices in Arizona schools, including prohibition of withholding recess as punishment. 600+ members, https://www.facebook.com/groups/1665720310347892/members/

Christine Davis, Founder. Parent of 2 Madison ESD students. Deputy County Attorney, Maricopa County.

Note: PA=physical activity Slide @07/28/2017

HFA Coalition
(cont'd/partial)

Stanfield ESD Leadership

Low-income rural school district with no M&O override, yet national leader in increasing physical activity & healthy nutrition & integrating health in standards-based curriculum; first AZ school: USDA Healthier US Schools Challenge Gold w/Distinction Award

Melissa Sadorf, Superintendent, EdD. All Arizona Superintendent of the Year for Small Size Districts; AZ Middle Level Principal of Year; https://vimeo.com/200605985

Chris Lineberry, Principal, EdD. Co-author, *Recess Was My Favorite Subject: Where Did It Go?*; Co-Founder, Core Purpose Consulting; http://www.raisingarizonakids.com/2014/07/chris-lineberry-putting-kids-first/

Pinnacle Prevention

Public health consulting, training, and technical assistance with emphasis in healthy eating and active living

Adrienne Udarbe, Executive Director, MS, RDN. Former Community Programs Manager, ADHS; Nutritionist, Amer.ican Red Cross

NAU Dept. of Health Sciences (Fit Kids of Northern Arizona /Northern Arizona Healthcare (NAH))

NAH-funded physical activity & healthy habits education programs for over 10,000 students in more than 20 schools in northern AZ.

Dirk DeHeer, Assoc. Professor, Dept. of Health Sciences, NAU. Research & evaluation focused on community-based physical activity & health promotion programs for high-risk populations & integrating these programs into health care systems

American Academy of Pediatrics, Arizona Chapter (AzAAP)

Committed to improving the health of Arizona children and supporting the pediatric professionals who care for them.

Anne Stafford, Executive Director. Formerly ED of Community Health Charities, Arizona Market.

Arizona Association of Health Plans (AzAHP)

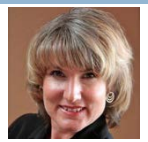
AzAHP's members serve the nearly 2M Arizonans enrolled in the state's Medicaid plan, AHCCCS.

Deb Gullett, Executive Director. Former member, AZ House of Representatives, incl. Chair of Health Committee. Former Chief of Staff, Sen. John McCain. Former Special Asst. to Pres. George HW Bush & Director of White House Office of Media Relations.

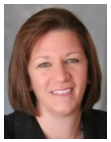
Arizona Public Health Association (AZPHA)

AzPHA's members include public health professionals & organizations across Arizona.

Will Humble, Executive Director. Former Director, Arizona Department of Health Services (ADHS).







Note: PA=physical activity Slide @08/01/2017

AZ Stakeholder Input from:

Superintendents/Arizona School Administrators (ASA)
Debbi Burdick, Calvin Baker*, Deb Duvall, Roger Freeman, Chad Gestson, Betsy Hargrove*, Mark Joraanstad, Melissa Sadorf, Jeff Smith, Paul Stanton*, Paul Tighe*
AZ School Boards Association (ASBA), AEA, AZ Health & Physical Education (AZHPE), SHAPE America, FTF
Carly Braxton, Steve Jeffries, Chris Kotterman*, Paul Kulpinski*, Matt Mixer, Andrew Morrill*, Tim Ogle*, Trish Robinson, Keri Schoeff, Hans van der Mars
Arizona State Board of Education (SBE) (& SBE's A-F School Accountability Ad Hoc Advisory Committee)
Catcher Baden, Calvin Baker*, Reg Ballantyne, Tim Carter, Roger Jacks, Michele Kaye*, Janice Mak*, J.D. Rottweiler*, Chuck Schmidt*, Karol Schmidt*, Jared Taylor*, Tom Tyree, Patricia Welborn*; (A-F: April Coleman*, Whitney Chapa*, Michael Henderson*, Mitra Khazai*, Foster Leaf*, Paul Tighe*)
Nonprofits/NGOs/Misc. (AforAZ, ABEC, AHA, AzAAP, AZ Chamber, AZ for Recess, AZPHA, CFA, Fit Kids, GS, GPL, Playworks, SALC, SVPAZ), Triadvocates
Amanda Burke, Ernie Calderon, Terri Wogan Calderon, Ellis Carter*, Whitney Chapa*, Patrick Contrades, Christine Davis, Pearl Chang Esau, Dick Foreman, Sybil Francis, Mike Gardner, Neil Giuliano, Stuart Goodman, Becky Hill*, Will Humble, Lisa Graham Keegan, John Kelly, Bert McKinnon, Jaime Molera, Dana Wolfe Naimark, Nicole Olmstead, John Pedicone*, Brandy Petrone, Jon Ragan, Paul Shoemaker, Anne Stafford, Marissa Theisen, Adrienne Udarbe, Chuck Warshaver, Jim Zaharis
Health Care Providers & Plans (AHIP, AzAHP (AHCCCS), AzHAA, Banner, BCBSAZ, HSAA (Alliance), Mercy Care/MMIC/Aetna, Tenet/Abrazo, United HC)
Tony Astorga, Reg Ballantyne, Chuck Bassett, Jason Besozo*, Jennifer Carusetta, David Childers, Mark Fisher, Tad Gary, Joe Gaudio, Deb Gullett, Suzanne Hensing, Debbie Hillman, Christi Lundeen, Andy Kramer Petersen*, Karrie Steving, Trisha Stuart, Deborah Fernadez-Turner, Greg Vigdor
Governor's Office (including **GOYFF)**
Kirk Adams*, Christina Corieri, Governor Ducey*, Katie Fischer, Debbie Moak, Danny Seiden*, Kristine FireThunder, Dawn Wallace
State & County Agencies (ACA, ADE, ADHS, AHCCCS)
ADE (AZ Department of Education): School Health/PE, ADHS (AZ Dept. of Health Services): AzHIP Obesity & Cross-Cutting Strategies/School Health Workgroups & BNPA, AHCCCS*, AZ Commerce Authority*, Maricopa County Dept. of Public Health
Legislators & Legislative Staff
Sylvia Allen, Catcher Baden, Nancy Barto, David Bradley, Kate Brophy-McGee, Paul Boyer, Heather Carter, Regina Cobb, Randall Friese, Gail Griffin, Katie Hobbs, Michael Hunter, Jay Lawrence, Debbie Lesko, Emily Mercado, JD Mesnard*, Lynne Pancrazi, Frank Pratt, Jesus Rubalcava, TJ Shope, Matt Simon, Steve Smith, Reed Spangler, Melissa Taylor, Kelly Townsend*, Bob Worsley, Steve Yarbrough*, Kimberly Yee*
Foundations/Grantmakers (Arizona Community Foundation/ACF, AGF, AZSTA, BHHS Legacy, Helios, Piper, Rodel, United Way); Others
Jacky Alling, Carlyle Begay, Don Budinger, Shelley Cohn, Robbin Coulon, Kim Covington, Jeff Dial, Jon Ford, Charles Hokanson, Kimberly Kur, Robin Lea-Amos, Laurie Liles, Jayson Matthews, Jackie Norton, Janice Palmer, Sue Pepin, Marilee Dal Pra, Suzanne Pfister, Roy Pringle, Steve Seleznow, Brian Spicker, Penny Allee Taylor, Mary Thomson, Merl Waschler, Glenn Wike, Jerry Wissink, Vince Yanez
Higher Education/Research
Tacy Ashby(GCU), Chuck Corbin(ASU), Dirk DeHeer(NAU), Kimberly LaPrade(GCU), Melanie Logue(GCU), Teri Pipe*(ASU), Jennifer Reeves(UofA), Hans v.d. Mars (ASU)
National Leaders, Experts & Others
CDC, CMS, Alain Enthoven, David Katz, Lloyd Kolbe, Lenny Mendonca, Michael O'Donnell, US House & Senate Legislators & Staff
***Notes**: *=spoke briefly with; []=[scheduled]. Not a comprehensive list. Green: particular thanks for key early encouragement and/or involvement by organization leaders. Note: these individuals & organizations are generally not formally affiliated with HFA. Key input goals: Do homework, understand perspectives, build consensus, figure out win-wins, etc. Lessons learned include: avoid unfunded mandates; no new taxes; must be accountable; non-punitive; need credible ROI; etc. Slide @07/28/2017*

Win-Win Health/K-12 Agenda

(details)

- **Unsustainable *health* crisis** → long-term ***education funding*** & **business/*economic*** crises
  - **1/3 children → diabetic adults;** declining funds for ed, tax cuts; pressure on profits, productivity; etc.
- ***1st stage solution***
  - **K-12 physical & health "preventive education"**
    - *It's* good for student achievement & engagement
    - *And* a rapid payback & great ROI for health organizations
- ***How get there?***
  - **Nonprofit leadership:** Healthy Future Arizona initiative: coalition, org. capacity
  - **K-12**: Help schools increase recess/physical activity, implement PE/health ed A-F accountability
    - Including scaling Empower Youth Health Program (EYHP)
  - **Partners co-invest & scale-up**: Private-public pay-for-performance: health orgs, govt.; via HFA
- ***Long-term goals***
  - **Grow to $300M+/year** in new $$ into K-12 from public/private health cost savings, higher tax rev.
    - Voluntarily co-investing 0.X% of chronic costs in evidence-based K-12 programs proven to improve health & lower diabetes/other risks
  - ***Reverse*** child obesity, diabetes, chronic epidemic trends in AZ, USA
  - **Improve** other aspects of health

Note: ROI=return on investment; A-F=A-F School Accountability formula (grade for each public school; adding PE, health ed indicators); SHI=School Health Index (wellness policy plan); EYHP=Empower Youth Health Program; HFA=Healthy Future Arizona. Slide @08/01/2017

How Can Health System Survive ↑↑ Pressure?

HFA improves whole-population health outcomes & lowers per-capita costs, by increasing physical activity & improving nutrition habits, starting K-12

Per-Person Max.$, Value-based, Lower Reimbursements, ACO, etc.

Margin$, Quality

Diabetes: >prevalence & >#years;
Obesity: earlier & >severe; etc.
Root Causes: inactivity, nutrition

Healthier People/Outcomes by addressing Root Causes → Helps Relieve Pressure on Health Costs & Quality

HEALTHY FUTURE ARIZONA

Google images: clipartfest, eBay.
Slide @08/01/2017

Helping Schools → Healthier Students

- **Overwhelming Evidence: Activity → Academic Achievement**
  - *Physical education & activity helps not hurts academic achievement**
    - *(ASA, ASBA invited us to present research from evidence-based PE, PA & nutrition programs at main conferences.)*
- **School-Friendly Policies & Implementation**
  - *Reasonable policy goals, e.g. A-F indicators as "positive incentives", equitable school recess (2/day)*
  - *Evidence-based programs with school track records, training & support, & funding*
    - *(e.g., assistance on introducing A-F fitness assessments, how to effectively allocate seat-time back to PE & recess, etc)*
- **A Little Win-Win School Funding goes a Long Way**
  - *Arizona educators very eager for new money into schools*
  - *Health orgs benefit financially immediately & long-term from more active, healthier children***

Notes: ASA=Arizona School Administrators association. ASBA=Arizona School Boards Association. References: *Trudeau & Shephard, 2008: "Given competent providers, **[up to 60 minutes] PA can be added to the school curriculum by taking time from other subjects without risk of hindering student academic achievement.** On the other hand, adding time to 'academic' or 'curricular' subjects by taking time from physical education programs does not enhance grades in these subjects and may be detrimental to health." Lees & Hopkins, 2013: systematic review of RCTs: "There was no documentation of APA [aerobic physical activity) having any negative impact on children's cognition and psychosocial health, **even in cases where school curriculum time was reassigned from classroom teaching to aerobic physical activity.**" For evidence on how MVPA boosts academic achievement: Ahamed et al, 2007: Action School! BC; Donnelly et al, 2009: PAAC; Fedewa et al., 2011; Hillman, Castelli et al, 2007- ; Hollar et al, 2010; Kamijo et al, 2011, 2012; Sallis et al, 1999; Shephard, 1996. **High levels of MVPA (moderate-to-vigorous physical activity) reduce health costs by min. est. $30-50/child/year. Evidence-based Empower Youth Health Program (EYHP) plans for, trains, & assesses to ensure high levels of MVPA @scale cost of $10/student/year = <1year payback. See other slides, edunuity.org for detailed references. Google images: School Book. Slide @08/01/2017

Why Educators Support?

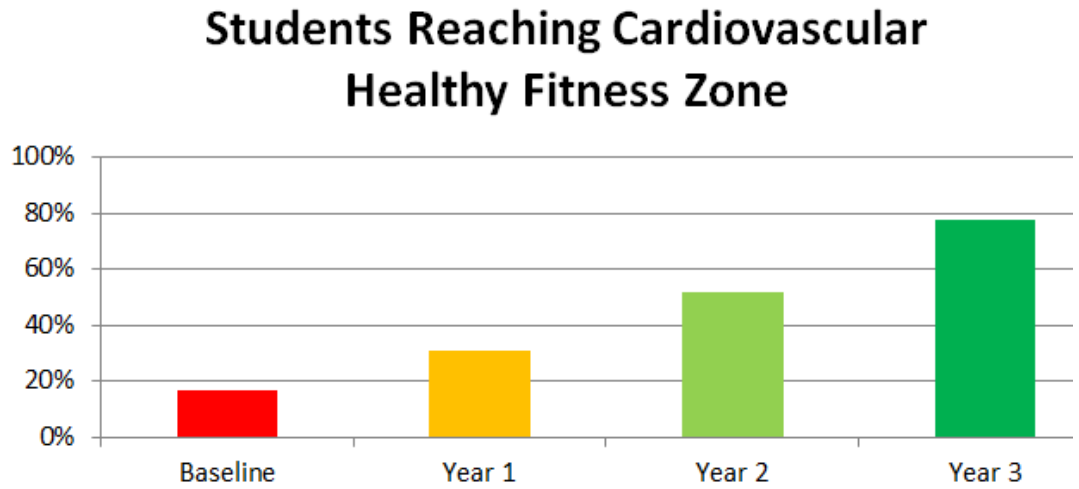
*M-V **physical activity (MVPA)** improves **academics***

- **Reallocating time *from* PE does not improve achievement**
  - Wilkins et al, 2003; Trudeau & Shephard, 2008
- **Keeping/increasing* time allocated *to* PE/PA does not harm achievement**
  - Kwak et al, 2009; Lees & Hopkins, 2013; Rasmussen & Laumann, 2013; RWJF, 2009; Shephard, 1996; Singh et al, 2012; Trost & van der Mars, 2010; Trudeau, 2010; Trudeau & Shephard, 2010; USDHHS, 2010
- **Regular Physical Activity (PA) throughout day helps academic outcomes**
  - Ahamed et al, 2007: Action School! BC; Donnelly et al, 2009: PAAC; Sallis et al, 1999
- **Moderate-to-vigorous PA (MVPA) improves cognitive functioning & academic performance**
  - Fedewa et al, 2011; Hillman et al, 2007- ; Hollar et al, 2010; Kamijo et al, 2011, 2012; Shephard, 1996
- **PE, PA, Sports increase engagement & reduce drop-outs**
  - Desy et al, 2013; Rumberger, 2011

Notes: e.g., *Trudeau & Shephard, 2008: "Given competent providers, **[up to 60 minutes] PA can be added to the school curriculum by taking time from other subjects without risk of hindering student academic achievement.** On the other hand, adding time to 'academic' or 'curricular' subjects by taking time from physical education programs does not enhance grades in these subjects and may be detrimental to health." Lees & Hopkins, 2013: systematic review of RCTs: "There was no documentation of APA [aerobic physical activity) having any negative impact on children's cognition and psychosocial health, **even in cases where school curriculum time was reassigned from classroom teaching to aerobic physical activity.**" See other slides, edunuity.org for detailed references. Slide @08/01/2017

EYHP: Evidence-based MVPA+ Program

much higher fitness, better health incl. lower diabetes/heart disease risk, from more moderate-to-vigorous physical activity @$10/student/year



Notes: $10/child/year cost at-scale of 50K-100K students/year. Empower Youth Health Program (EYHP) results 2012-2015 from lower-income AZ schools with 79-98% FRL (Free & Reduced Lunch) student population; 90% Hispanic, 5% Native-American, 3% White, 2% African-American. By Year 3: 20 schools in EYHP, 16,000 students, Sunnyside USD, Tucson; **increased % students with cardio-vascular aerobic fitness 4x from 17% to 78%; >6x increase in % of students with good nutrition: 11% → 73%** consuming recommended fruit & vegetable servings; **% of students at normal weight increased by 12.5% from 48% to 54%** among students in the Healthy Fitness Zone (HFZ), even though students would typically be increasing BMI and becoming more obese as they age; 35-40% of students receiving 60+ mins. PA/day. Healthy Fitness Zone is the national FitnessGram/PYFP standard for fitness, as measured by objective aerobic capacity (PACER), BMI, & muscular strength & endurance metrics. **EYHP costs $10/student/year at scale** (produce costs may be additional). References: Reeves, 2016: *US Department of Education Grant Performance Report (ED 524B)*: Jennifer Reeves, UofA, Principal Investigator; fall 2012 - spring 2015. Other notes/references: EYHP costs kept low by: school-wide wellness policy planning; training existing PE & classroom teachers & MS/HS student fitness volunteers (& not adding more staff); and regular assessment with FitnessGram. Moderate-to-vigorous physical activity (MVPA) & healthy nutrition increase brain capacity & academic achievement, per extensive research evidence. Teen aerobic fitness is correlated with 35% less heart attacks in middle-age (Hogstrom, Nordstrom, 2014); reducing % of Medicaid enrollees with CVD by 35% would save $50B/year nationally (Kaiser Family Foundation, 2012). Teen fitness correlated with $^1/_2$-$^2/_3$ less risk of type 2 diabetes in middle-age (Crump et al, 2016). Potential for EYHP & school-based preventive education to **reduce chronic health conditions & costs by 20+% with 100x or more ROI,** including postponing disease on-set, reducing disease severity from up to 13 years healthier behavior (Edunuity estimate; see other slides). Rapid payback for health sector within first year of EYHP implementation in schools, due to reduced health costs for ADHD, asthma, obesity, depression, and related preventable child health issues (see Payback slides/references). Rationale: as fitness increases & nutrition improves, chronic health conditions decrease, Medicaid/AHCCCS/health insurance & out-of-pocket health costs decrease, & productivity & GDP increase from less absenteeism/ presenteeism (Milken, 2007); also, as a result, state (& local & federal) tax revenues go up & govt. costs go down.

Slide@07/27/2017. Contact: Scott Turner 602-513-0028 scott.turner@edunuity.org

EMPOWER Youth Health

How So *Effective* @$10/Student/Year?:

P-T-A: Plan + Train + Assess

*Optimizing **existing** school staff **with students**, with available PE & recess time*, **without added personnel***

Plan: **Develop Policy/Plan for School-based Health Promotion**

- Mutually agreed wellness policy plan by staff to improve health: incl. administration, food services, nurse, classroom & PE teachers
- Prioritize plan with self-assessment of all school-based health-related elements;
  complete CDC's School Health Index (SHI) to identify & reduce health risk behaviors, including addressing gaps & weaknesses

Develop Community Partnerships including School Health Advisory Councils (SHAC)

- Plan includes before, during, and after school, as well as on weekends, holidays, and vacations (e.g., parents, school food service vendor, neighborhood associations, community-based organizations (CBO), park and recreation, YMCA's, after-school programs, Walking School Bus Programs, local businesses, and more), promoting youth & community physical activity & healthy nutrition etc.)
- SHAC to help improve instructional programs, policies, & support services for the 8 components of a coordinated school health/ WSCC model; meet min. every other month, ensure wellness implementation for students, staff, & community

Train: **High-quality Standards-based Instruction** to optimize **Physical/Nutrition/Health Education**

- Professional development of K-12 teachers, other staff + on-going field support; including training to reach 60 minutes/day of moderate-to-vigorous physical activity (MVPA during classroom "brain breaks", recess, PE, pre/post-school)

Develop Student Leadership

- Student volunteer peer-led physical & wellness activities by trained older students, before, during, after school incl. lunch & recess

Assess: **Regular Assessment of Student Health Behavior**

- FitnessGram (Presidential Youth Fitness Program/PYFP), CDC-validated nutrition survey questions, student portfolio/health self-help "CV"; updated SHI, & other validated assessments for reliable, balanced, comprehensive review & **continuous improvement**

Notes/References: EYHP $10/child/year cost at-scale of 50K-100K+ students. WSCC: Whole School Whole Community Whole Child model. *Schools with inadequate numbers of certified PE teachers &/or low PE & recess minutes can usually fund PE/recess expansion, by re-allocating their existing instructional time & funds back to PE & recess, without harming academic performance (Kwak et al., 2009; Lees & Hopkins, 2013; Rasmussen & Laumann, 2013; RWJF, 2009; Shephard, 1996; Singh et al., 2012; Trost & van der Mars, 2010; Trudeau & Shephard, 2010; et al); in fact, schools can increase academic success with rigorous PE/MVPA (Ahamed et al, 2007: Action School! BC; Castelli et al, 2007-12; Donnelly et al, 2009: PAAC; Hollar et al, 2010; Kamijo et al, 2011, 2012). Slide @07/14/2017

Fit Kids: MVPA Prog. #2

*Northern AZ Healthcare **investing $1M/year** in schools*

- **Outcomes:** ***~50% reduction in likelihood* of child obesity***

  → ***Est. $60-90**/student/year health cost savings = 1st year payback***

  ($60-70/student/year physical activity program cost)

- ***If NAH's peers invested comparable amount = $100M+/year new K-12 money for Arizona***

  $1M/yr from Northern AZ Healthcare, since 2012 *=~$100/student/yr invested in PA, etc.*

- *20 elementary/middle schools, 5 districts, >9000 students/year in greater Flagstaff+*

- *Mandatory 1 class/week moderate-to-vigorous physical activity (MVPA) & nutrition ed, led by trained Health Aides*

  Optional before/after/lunch activity sessions

  Supplements existing PE, health education

- Evaluation = *evidence-based: 2350 children, 4x BMI measurements over first 2 years*

Note: *50% reduction in the incidence of being overweight from what would be expected based upon school district data. Based on 7.5-10% of students not being obese, who would have otherwise been obese @$600 health cost/obese student/year, NAH is estimated to be saving $45-60/student/year in obesity-related costs alone; ADHD/asthma/depression & other mental health savings could add savings of up to $30-50/student/year. Fit Kids physical activity programs in K-8 schools costs approx. $60-70/student/year, primarily cost of trained health aide to lead physical activity (PA). References: Child obesity health costs: Buescher et al, 2008; Hampl et al, 2007; Kuhle et al, 2011; see MVPA-related annual child health cost savings slides for detailed references. Fit Kids evaluation reports (DeHeer, 2014) & emails with NAU Prof. DeHeer; Fit Kids website: https://nahealth.com/fit-kids; Fit Kids staff. Edunuity total cost savings estimates. Slide@07/27/2017

MVPA: Payback <1 Year

rapid ROI from health sector investment in moderate-to-vigorous physical activity
@$10/child/year (cost at-scale)

Health Condition	Treatment Cost (per treated student/year)	Prevalence (% students with condition)	Reduced Incidence (% drop in students with condition)	Grade Levels with Most Reduced Costs	*Average Reduced Health Cost per Student/Year (all students)*
Asthma, ADHD, Obesity, Depression/Other Behavioral Health	**$400-1500**	**5-24%**	**14-33%**	**Roughly spread across K-12**	***$30-50***

Notes: High levels of MVPA (moderate-to-vigorous physical activity) reduce health costs by est. $30-50/child/year. Evidence-based Empower Youth Health Program (EYHP) preventive "ed-vaccination" plans for, trains, and assesses to ensure high levels of MVPA @scale cost of $10/student/year = <1year payback. EYHP costs per student are higher at smaller scales: ~$15-30/student/year. It often only takes ~1-2 children per class becoming healthier to pay back EYHP investment within 1 year. Payback/ROI formula: Condition Cost x Condition Prevalence x Reduced Incidence of Condition = Treatment Cost Reduction per Average Student (across all students). K-12: Kindergarten through12th grade. ADHD: attention deficit/hyperactivity disorder. BH: behavioral/mental health. MS: middle school. HS: high school. MVPA is key to improving many of these conditions: MVPA=e.g., after several minutes of MVPA, children are panting, starting to sweat, & having trouble conversing while moving. Target total of 60 minutes/day of MVPA from before, during and after school activities. Utilized peer-reviewed journal articles, when available, and also population data from government statistics/reports. ADHD & depression can improve particularly quickly, though BMI has been improving within 1-2 years in both EYH and Fit Kids. Reduced incidence of obesity estimated based on reduced obesity compared to what would have been expected in that sociodemographic population at those ages. Longer-term ROI = >100x, as health condition on-set is delayed or averted & the severity in middle age & later is postponed and reduced. Rapid payback at all grade levels by particularly reducing: Elementary: ADHD, asthma; MS: ADHD, misc.; HS: obesity, depression/BH. ADHD & depression costs vary dramatically based on type of treatment, and can be much higher. Also, EYH payback/ROI is estimated based on changes in the 78% of students now in the Healthy Fitness Zone (HFZ); however, the 22% non-HFZ obesity rates did not likely improve as much. There is some possible double-counting of teen obesity/depression/BH savings, since obesity costs can include some depression/BH costs. Class size assumption: 30-35 students. References include: Domino et al, 2009; Fullerton et al, 2012; Hampl et al, 2007; Katz et al, 2010; Kuhle et al, 2011; MACPAC, 2015; Pelham et al, 2007; Schuch et al, 2016; Skinner et al, 2016; Thapar et al, 2012; Wang et al, 2005. Also, per Yamamoto, 2013: significant costs (& savings) can start early in life: "Chronic conditions in the young (under age 30) take a higher relative toll on that population than they do for the older population. For commercial members under 30 identified with cancer or circulatory conditions…their costs were much higher on average." More Notes & References: see Payback Details slide. Slide @06/08/2017.

Preventive Power of Physical Activity "Doses"

evidence-based rapid payback during childhood from MVPA

Condition	Treatment Cost	Prevalence	Reduced Incidence	Grade Levels w/ Most Reduced Costs
Asthma	$400 (Wang et al, 2005)	6% (Wang et al, 2005)	14% (Katz, Cushman et al, 2010)	Elementary, MS
ADHD	$1,000-$1,500 (CDC, 2016; Fullerton et al, 2012; Pelham et al, 2007)	7-9% (Wolraich et al (CDC), 2012/2014; MACPAC, 2015)	33% (Katz, Cushman et al, 2010)	Elementary, [MS]
Obesity	$600 (Buescher et al, 2008; Hampl et al, 2007; Kuhle et al, 2011)	12-24% (DeHeer, 2014; Reeves, 2016; YRBS - AZ, 2013)	10-20% (DeHeer, 2014; Reeves, 2016; Skinner et al, 2016; Edunuity est.)	[MS], HS
Depression/BH	$700 (Domino et al, 2009)	3-5% (MACPAC, 2015; Thapar et al, 2012)	26-33% (Shuch et al, 2016)	[MS], HS

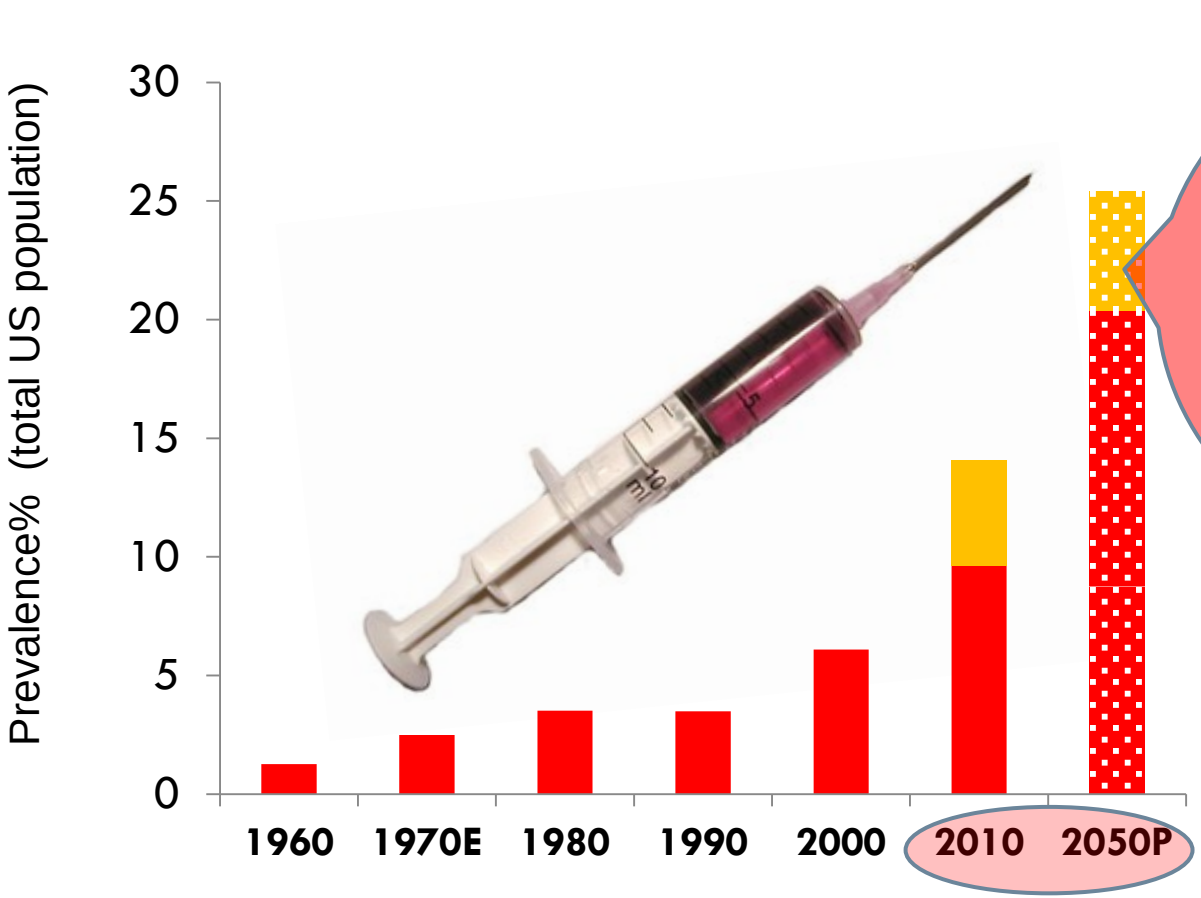
Notes: MVPA = moderate-to-vigorous physical activity. ADHD: attention deficit/hyperactivity disorder. BH: behavioral/mental health. [MS]: moderate cost reduction among middle school students. HS: high school. More Notes & References: see other Payback Details slides.

References: Buescher, Whitmire, Plescia, 2008: *Relationship Between Body Mass Index & Medical Care Expenditures for North Carolina Adolescents Enrolled in Medicaid in 2004.*
DeHeer, 2014: *Fit Kids at School: Executive Report.* Domino, Burns, Mario, et al, 2009: *Service Use and Costs of Care for Depressed Adolescents: Who Uses and Who Pays?*
Fullerton, Epstein, Frank, Normand, Fu, McGuire, 2012: *Medication Use and Spending Trends Among Children With ADHD in Florida's Medicaid Program, 1996-2005*
Hampl, Carroll, Simon, Sharma, 2007: *Resource Utilization and Expenditures for Overweight and Obese Children.*
Katz, Cushman, Reynolds, et al, 2010: *Putting Physical Activity Where It Fits in the School Day: Preliminary Results of the ABC (Activity Bursts in the Classroom) for Fitness Program.*
Kuhle, Kirk, Ohinmaa, et al, 2011: *Use and cost of health service among overweight and obese Canadian children.*
MACPAC, 2015: *Behavioral Health in the Medicaid Program—People, Use, and Expenditures.*
Pelham, Foster, Robb, 2007: *The Economic Impact of Attention-Deficit/Hyperactivity Disorder in Children and Adolescents.*
Reeves, 2016: *US Department of Education Grant Performance Report (ED 524B) (report on early Empower Youth Health & related elements).*
Schuch, Vancampfort, Richards, et al, 2016: *Exercise as a treatment for depression: A meta-analysis adjusting for publication bias.*
Skinner, Perrin, Skelton, 2016: *Prevalence of Obesity and Severe Obesity in US Children, 1999-2014.*
Thapar, Collishaw, Pine, Thapar, 2012: *Depression in Adolescence.* Wang, Zhong, Wheeler, 2005: *Direct & Indirect Costs of Asthma in School-age Children.*
Wolraich, et al, 2014 (CDC): *Key Findings of The Prevalence of Attention-Deficit/Hyperactivity Disorder: Its Diagnosis and Treatment in a Community Based Epidemiologic Study.*
Edunuity summary costs/prevalence/reduced incidence estimates, based on above studies; $ & % range estimates based on conditions with biggest impact on cost at given ages.

1/3 Students will become Diabetic !?!

23% Teens Pre-diabetic** already from **Inactivity & Unhealthy Nutrition

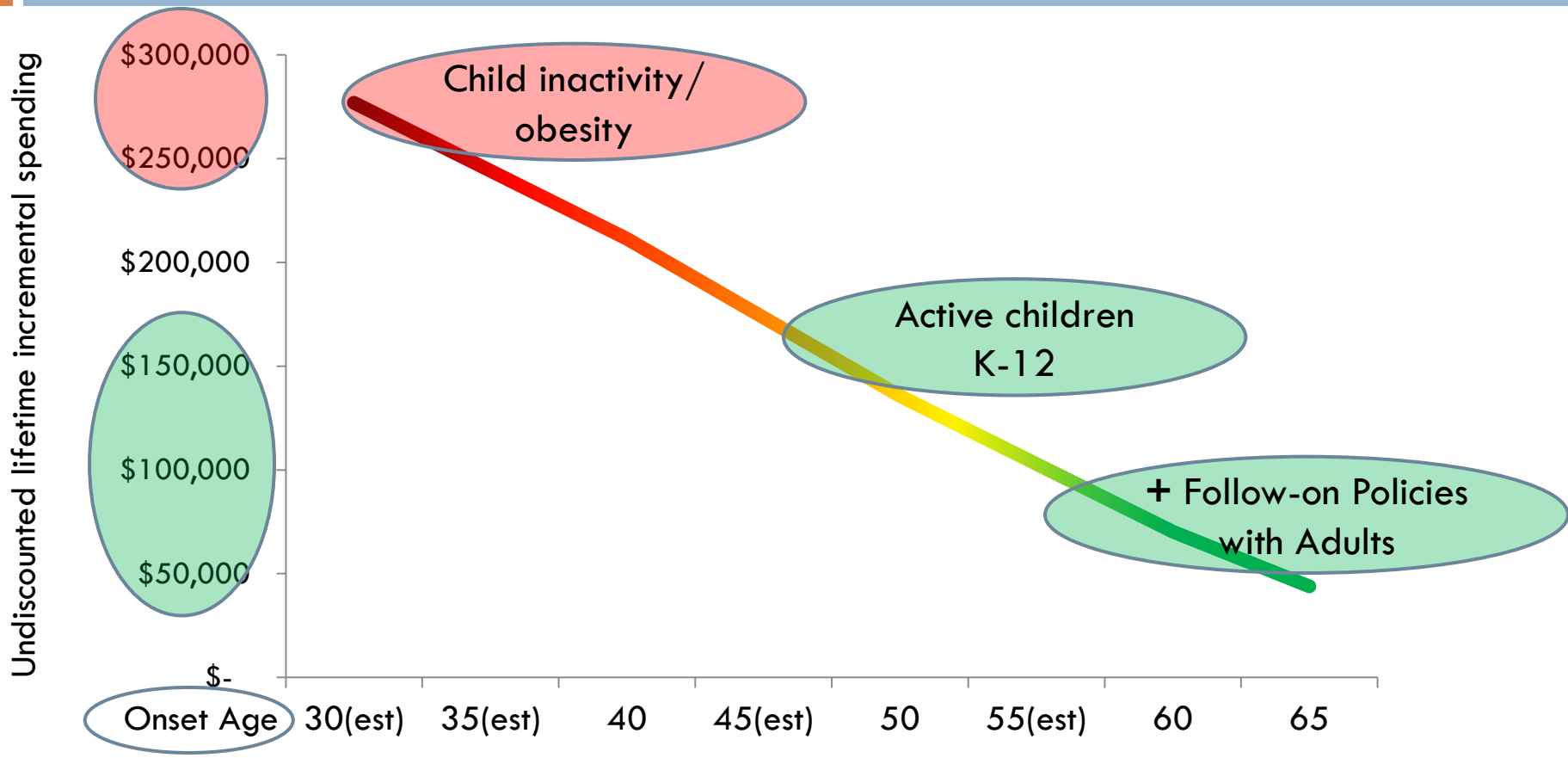
Diabetes cost nearing **$15,000/adult/year** [***3x** person with no chronic disease*]



Notes: 23% teens, 35% of adults pre-diabetic: 86M/243M adults. Approaching 500,000 w/diabetes in AZ now. Much higher-than-average diabetes rates among Mexican-American, Native-American, & lower-income populations. Diagnosed + undiagnosed diabetes, prevalence% of US population calculated using same diag./undiag. ratio as in 2010. $245B = USA diabetes costs 2012, 41% increase in 5 years, & still growing fast. Annual medical expenditures per nonelderly (ages 18-64) adult enrollee in Medicaid, 2009: No chronic conditions=$4,342/year; CVD (cardiovascular disease) =$9,414/yr; Diabetes=$13,313/year; after out-of-pocket costs; per Kaiser FF. References: *Pediatrics*, 2012 in USNews, 5/21/2012 (youth prediabetes); Diabetes. org (adults; USA); Boyle et al, 2010 ("middle-ground projections); CDC, 2014: *Long-term Trends in Diabetes*; Schneiderman et al, 2014; other estimates & details @edunuity.org. Google image: MindFreedom Slide@08/01/2017

Postponing Diabetes Onset Dramatically Reduces Costs

e.g., less teens pre-diabetic; remaining pre-diabetic instead of becoming diabetic; becoming diabetic when elderly, not in middle-age; >100x lifetime payback/ROI for Empower Youth Health Program evidence-based preventive education



Notes: Lifetime cost varies enormously by age of diabetes onset. Data includes both men and women. References: Zhuo et al, 2014, *The Lifetime Cost of Diabetes and Its Implications for Diabetes Prevention*: Table 2—Life-years lost to diabetes and lifetime incremental medical spending attributed to diabetes (sources: linked data from the 2005–2008 National Health Interview Survey and the 2006–2009 Medical Expenditure Panel Survey and from published national vital statistics). Earlier and interval costs estimated by Edunuity: "(est)". Also: Reference: Crump, Sundquist, et al, 2016: *Physical fitness among Swedish military conscripts and long-term risk for type 2 diabetes mellitus*: "These findings suggest that interventions to improve aerobic and muscle fitness levels early in life could help reduce risk for type 2 diabetes mellitus in adulthood." [1/2 to 2/3 reduction in risk] Empower Youth Health (EYH) is an evidence-based program that improves aerobic/cardiovascular fitness and muscular strength, as verified by FitnessGram (Reeves, 2016). → The level of fitness achieved by EYH Program could help reduce diabetes risk by ½ to 2/3. Slide @07/30/2017.

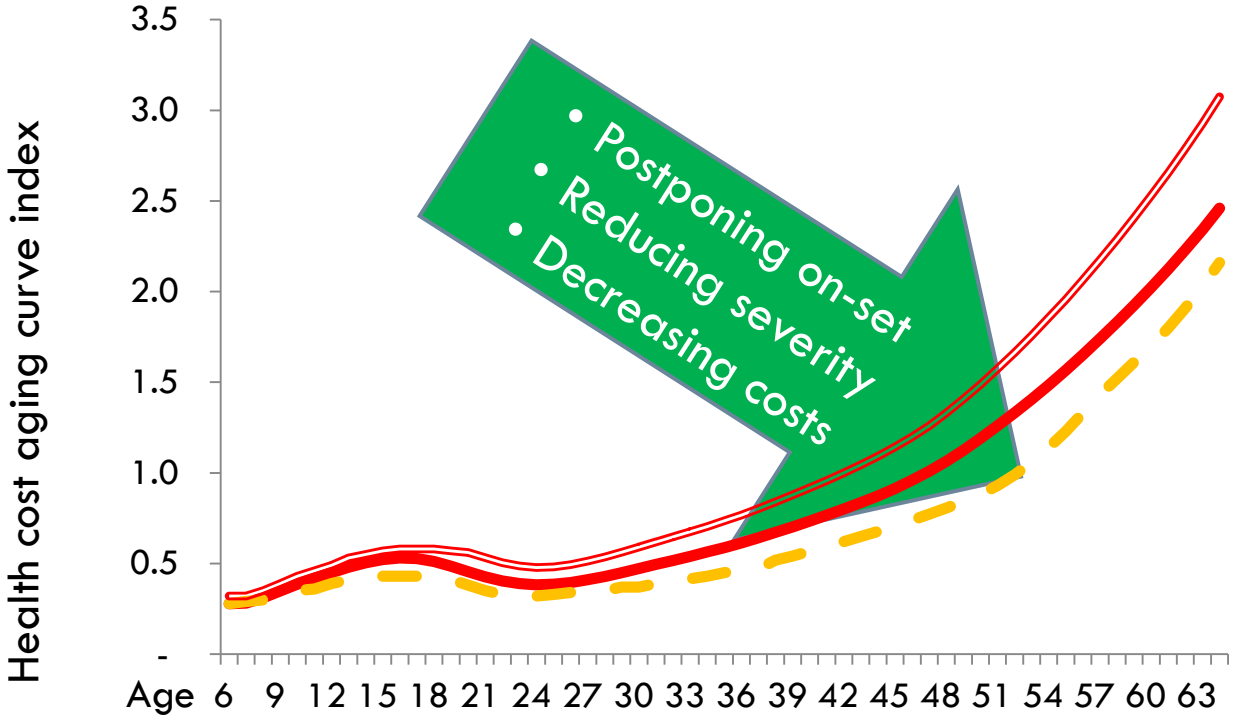
20-50% Lower Later-Life Costs

postponing chronic condition on-set, reducing adult severity, compared to historical & current trends--due to 13 years effective, evidence-based, preventive K-12 PE/health education

HEALTHY FUTURE ARIZONA

EMPOWER Youth Health

Fit Kids



Note: Based on relative health care cost in 2010, by age, for nonelderly males in US commercial market, per Society of Actuaries (**solid red line**). Preliminary projections estimated very roughly/conceptually: If costs are shifted down by 5 years (in effect, the onset & impact of chronic conditions are postponed & moderated due to prolonged, effective, early intervention K-12), total amount saved for ages 6-64 is 22%; if shifted down by an average of 10 years, 36% is saved; if shifted down 6.5 years initially then tapering toward 0 years (i.e., returning toward current actual costs by age 64), 19-20% is saved. What is more, if current trends continue, costs in 2030 and 2050 could be at least 10-25% more expensive than in 2010 for the same age in real 2010 dollars, since **so many individuals will have had very unhealthy behavior from an early age.** Per Yamamoto, 2013: significant costs [& savings] can start early in life: "Chronic conditions in the young (under age 30) take a higher relative toll on that population than they do for the older population. For commercial members under 30 identified with cancer or circulatory conditions…their costs were much higher on average." Also see Payback slides: EYHP can pay for itself within 1st year. References: 2010 commercial cost data held by Health Care Cost Institute (HCCI) with analysis from: Yamamoto, 2013: *Health Care Costs—From Birth to Death*, sponsored by Society of Actuaries; reduced costs estimated by Edunuity based on research data including Crump et al, 2016; Hogstrom et al, 2014; Zhuo et al, 2014; Turner, 2016-17; also see Payback Details slide. Preliminary concept slide @07/29/2017.

Strategies that Worked vs. Smoking…

*Yet We **Aren't Doing Now** to Promote **Physical Activity & Healthy Nutrition***

*[Report Card graded (A-F): **if & how well we are re-using strategies that helped reduce smoking**]*

- **Broad & profound awareness of seriousness of problem** ***(D)***
- **Strong health-related education programs in schools** ***(D)***
- Hard-hitting, pervasive public information campaigns ***(F)***
- Very strong government health warnings ***(D)***
- Large insurance premium discounts for healthy behavior ***(D)***
- Cost-effective behavior cessation/adoption products/programs ***(D)***
- Government restrictions on unhealthy product marketing/promotion ***(F)***
- Dramatically increased unhealthy product sales taxes* ***(F)***

Notes: **Effective steps we can realistically start taking NOW are bold and/or underlined**. Anti-smoking track record: 42% US adults smoked in 1965 → 17% US adults now. List of key strategies that helped to dramatically reduce smoking among Americans; followed by an (A-F) grade, indicating Edunuity's rating of how well AZ & the USA are using the particular strategy to prevent other unhealthy behaviors--particularly lack of physical activity and unhealthy nutrition--and thereby prevent or reduce chronic health conditions. Ranked by Edunuity in rough order of what is realistically implementable & politically achievable starting in 2017. *Population-wide K-12 preventive education ("ed-vaccination") builds a foundation of support for other policies, including by "raising consciousness" of students & their parents & communities about the impact of health-related behavior.* *Taxes could be imposed in revenue-neutral/no net new taxes manner; and only after public & political support grows, due to greater recognition of *de facto government* subsidies provided for unhealthy behavior, by taxing unhealthy products & services at the same rate as healthy products & services--with the public paying the costs of everyone else's unhealthy behavior through Medicaid, Medicare, A(H)CA/BCRA, higher health insurance premiums due to others' preexisting conditions, etc. Also, healthier behavior increases productivity, boosts profits & income, & raises GDP, which increases tax revenue without tax increases. References: alexiamuscat1.blospot.com at Google images; CDC, 2015 (NHIS, 1965; YRBSS 2013 data, AZ: HS student cigarette use); *Ending the Tobacco Problem*, Institute of Medicine, 2007; Turner, 2014-17. Slide @07/29/2017

Why Schools ***Indispensable*** for Health ?

preventive education for healthy behavior: biggest health issues now ***from unhealthy ehavior,*** *not microbes*

- **"Captive" long-term audience**: 180 days/year x 13 years
  - vs. 1 hour?/year with pediatrician
- Developmentally **ideal stages for learning**: ages 5-17
- **Very low cost** per person:
  - main school/staff "fixed" costs covered already by public K-12 funding
- Many effective, **evidence-based approaches**
  - @PE, HE, recess, classroom, before/lunch/after-school; EYH, Fit Kids programs, etc.
- Can **influence parents & communities** through children/schools
- **Lays foundation** for personal "ownership" of health as adults
  - Preparing each person K-12 to adopt future *clinical* & public health advice
- Nothing else comes close in affordable **total population** impact

*[**Alternatives ??: Clinical settings not turning the tide…***

*& **Improving adults' behavior** is **very expensive & much less effective.**]*

How?

HEALTHY FUTURE ARIZONA

Google images: Frog-in-pot from RGB Blog. Slide @08/01/2017

HFA Intermediary Role Ensures Outcomes, ROI

- *Funders invest **via HFA, not directly in schools or through public agencies***
- ***HFA implements & assumes responsibility** for health outcomes*
- *Pay-for-performance/success: **without results, the monies stop***

INVESTMENT$

HEALTH OUTCOMES

FUNDERS

- Foundations, Others
- **Health Care Providers & Plans**
- Legislature, Counties
- Medicaid/ CMS, CDC

COLLABORATORS

- Gov. Office, ADE, ADHS, AHCCCS
- Health & Education Associations & Nonprofits
- State & Regional Community Groups
- Business/ Leadership Orgs., Foundations, Others

IMPLEMENTERS

- **School Districts:** School Boards, Superintendents, Staff
- **Schools:** Principals, PE & Classroom teachers, Food services directors, School nurses, Other school personnel, Parents, Community representatives
- Local Nonprofits, Others

Healthy Future Arizona Initiative Overview

discussion draft slide version @06/14/2017

Working title	**Healthy Future Arizona** (HFA) initiative [affiliated with Healthy Future US (501(c)(3))]
Org. Status	Via fiscal sponsorship under Arizona Community Foundation [501(c)(3) pending]
First Priority	Scaling *Empower Youth Health Program* in AZ (& TBD) to trajectory of >20% reduction in chronic diseases & costs, using school-based approaches (PE/PA, nutrition ed, etc.)
Follow-on Priorities	Co-develop path to ~50% reduction in chronic diseases & costs; including outside of school settings TBD; dramatically improve other aspects of healthy behavior, too
Vision	Arizona becoming the healthiest state (& USA the healthiest country)
Mission	**Empowering individuals to substantially improve their health**, in the broadest sense, using **school-based & other** approaches to develop **lifelong healthy behavior**
Values	High-integrity, accountable, move-the-needle-systemic, practical + scalable, ROI-evidence-based, pay-for-performance/success, sustainably self-funding, sense of urgency/emergency, in partnership, & in local/community/social context
"Health"	Whole-person: physical, cognitive, social-emotional, mental, financial, civic, creative, etc.
Tagline (draft)	Healthy habits for a healthy life (TBD?)
ROI-based	Highly results-oriented, hard-evidence-based, objectively quantified costs & outcomes, accountable & pay-for-performance/success; measuring & delivering financial, public + private, socioeconomic & quality-of-life returns
Governance	Independent on-going statewide citizens/community oversight board/"commission" : shared governance; social, econ., political, geographic cross-section, incl. key funders
Funding	**Year 1-2 seed funding** by leading **Co-Founder-Partners** → evolving longer-term to sustainably self-funding via **HFA health outcome value-add**

Possible Partnership/Funding Areas

- **Joining coalition for Healthy Future Arizona initiative**
- **Investing in:**
  - Helping Scale Empower Youth Health Program (EYHP)
    - Investing in schools in targeted neighborhoods, districts, etc.
  - Program Health Outcomes Evaluations
    - Researching association between EYHP, Fit Kids of Northern Arizona & health outcomes/cost-savings
  - HFA Capacity Building
    - Staff, communications (e.g., website, social media), fund-raising, related costs
  - ADE School Report Card
    - Expand indicators including PE/recess/health-related information for parents/public
    - Help ADE & schools with development & implementation of system
  - A-F School Grading Indicator Implementation
    - Training, support for schools to implement physical & health ed accountability metrics (FitnessGram, etc.)
  - Policy Advocacy
    - School recess expansion, Whole child resolution, EYHP appropriations (matching), TBD

Next Steps: HFA Initiative

- **Short-term Policy Advocacy:**
  - **Add PE/HE indicators** (*in progress*): A-F School Grading Formula; ADE School Report Card
  - **Expand recess K-5** (*in progress/HB2082 successor*), **other whole-child ed/health bills** TBD
- **EYH Scaling:** Empower Youth Health Program to 90+ low-income schools
- **HFA Capacity Building:** $$ for Healthy Future AZ/US launch incl. staff
- **Foundations/Others:** Help expand coalition, capacity$, scaling$$
- **Health Sector Funding:** Early champions with seed $$ for HFA, EYHP, etc.
- **Measurable Pay-for-Performance Goals:**

→ First steps: $1-5M/yr EYHP scaling to $11M/yr all-AZ EYHP ASAP, with quantified outcomes/ROI

- Save health sector min. $30-50/student/year in child costs, $billions/year longer-term, compared to current trajectory

→ Longer-term: AZ first state to clearly reverse child obesity & diabetes trends

→ Longer-term: $300M+/yr new money → K-12; $200M+/yr new state tax revenues

- From health cost savings & productivity/profit increases
- Government/public & private sources co-investing, with high ROI
- Voluntarily co-investing 0.X% of chronic costs in evidence-based K-12 programs proven to improve health & lower diabetes/other risks