Streetcoin: integrating place-based social landscape with healthcare risk models through the electronic health record

Alan Waxman, MLA Chethan Sarabu, MD

> Healthy City International 2019 Monday October 14th, 2019



Alan Waxman, MLA

Landscape Architecture Urban Design

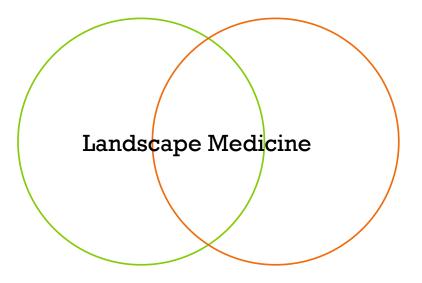


Chethan Sarabu, MD

Paediatrics Clinical Informatics



Municipalities City Planning Landscape Architecture Streets, Parks, Buildings Maps Healthcare system Doctors Nurses Hospitals & clinics Electronic health records 21st century model



Landscape medicine:

A place-based framework for valuing community assets through the healthcare system

Landscape Medicine

A place-based framework for valuing community assets through the healthcare system



Electronic Health Records/Maps

Cipher/streetcoin

Patients/Community

Social determinants of health/Environment

The time is ripe to connect landscape and medicine; particularly in the United States but globally as well.

As costs have escalated, all health systems are looking to invest in upstream preventive measures to decrease costs.

We also now have the technology and data layers to link the urban landscape, people, and health systems.

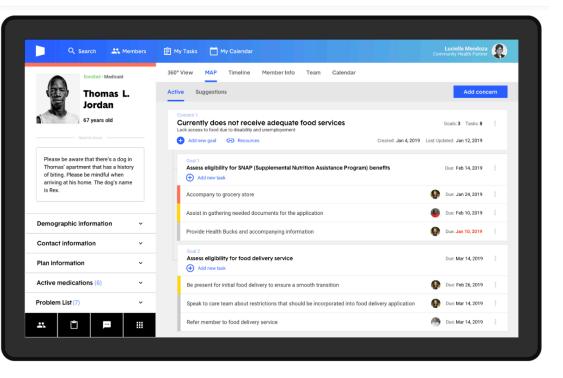
This is giving rise to a new type of healthcare/insurance system known as Accountable Care Organizations (ACOs).



Health is local.

Cityblock was founded on the premise that health starts at the neighborhood level, and that everyone should have good care for what matters to them. We saw firsthand how healthcare has fallen short in providing adequate care for people living with complex health and social needs—and knew there was room for improvement.

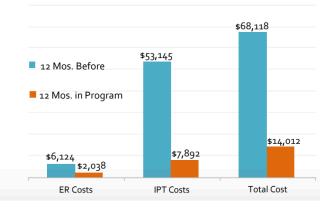




Cost Avoidance

Figure 6: Cost Avoidance

Hospital Cost Avoidance Pre– and Post– Enrollment \$54,106 average per person per year, n=77



Net Cost Avoidance: Amount saved after accounting for 10th Decile Program Costs \$34,306—\$39,556

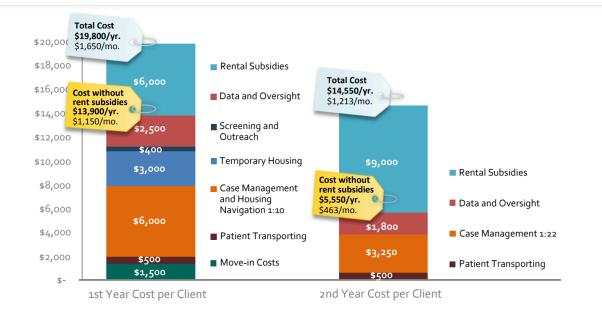
ER Costs Down 67%

Inpatient Costs Down 85%

Total Costs Decreased 79%

10th Decile Project

Los Angeles, CA | September, 2015





(f)(¥) HOME ABOUT RESOURCES - PROGRAMS - CONTACT

Search

Health Benefits

The Benefits of Nature are **Mental**

There are currently more than 400 studies that demonstrate the numerous health benefits that nature provides. Below we've highlighted a few key resources that give an overview of the findings. You can also find relevant infographics in the ParkRx toolkit.





Literature Reviews





For Health Professionals

Have you ever prescribed Nature before? As a provider, are you ready to try something new?

How much time do you spend outside in a natural setting during YOUR free time?

Take the opportunity to capitalize on the provider burnout that has to do with prescribing the same medications and doing the same things we do every day without considerable change in our patients' lives.

Learn More »



CREDIT: National Park Service

Prescribe Parks What is Park Rx America? Resources Media Contact

We work closely with managers of public lands to ensure patient access to therapeutic time in nature.

Park Rx America has collected data on thousands of parks and green spaces, searchable by location, with results filterable by standard park attributes and features, and viewable as printable one-page Park Summaries.

We have demonstrated scalability by replicating the park prescription model in diverse park agencies and health provider organizations across the country.

Learn More »

Bx

PRESCRIBER LOGIN 🌡

For Park Agencies



Re

No. 1

7

19

Ree

- 4 Grea
- Redu 5
- 6 Red
- Incre
- 8 Low
- 9 Imp
- 10 Imp
- 11 Imp
- 12 Imp 13
- Imp 14 Red
- 15 Red
- 16 Bett
- 17 Imp 18
- Imp Ad

Ca Ch Red

- 20 Ast and

Note: ADHD, attention-deficit hyperactivity disorder. The references in Table 1 are illustrative rather than exhaustive; they include both recent reviews and research reports and older, widely cited publications.

Table 1. Summary of evidence-based health benefits of nature contact.

Berg and Custers 2011; van den Berg et al. 2010; Ward Thompson et al. 2016 Astell-Burt et al. 2013; Grigsby-Toussaint et al. 2015; Morita et al. 2011titter sleep proved mental health: (educed depressionAstell-Burt et al. 2014; Grigsby-Toussaint et al. 2015; Morita et al. 2013; Summ and Cohen 2014; Taylor et al. 2015; White et al. 2013 (Backern et al. 2016; Nutsford et al. 2013; Summ and Cohen 2014; Taylor et al. 2015; White et al. 2016; Nutsford et al. 2013; Summ and Cohen 2014; Taylor et al. 2015; White et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013duced agressionBogar and Beyer 2016; Branas et al. 2001; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2013; Fan et al. 2014; Van den Berg 2011creased prosocial behavior and social connectedness wer blood pressure proved postoperative recovery proved birth outcomes proved child development (cognitive and motor) proved paines et al. 2015; Stark et al. 2014; Brown et al. 2016; Theren et al. 2015; Maas et al. 2016; Theren et al. 2016; Herts et al. 2016; Detwer et al. 2016; Theren et al. 2016; Brawn et al. 2016; Theren et al. 2016; Herts et al. 2016; Clean et al. 2017 Fjortof 2001; Kellert 2005 Actuely (Diette et al. 2013; Guggenheim et al. 2014; Brown et al. 2016; Theren et al. 2016; Bell et al. 2008; Licelard et al. 2009; Padvand et al. 2016; Thiering et al. 2016 Hertes et al. 2016; Clean et al. 201	Health/well-being benefits	References		
titer sleep Astell-Burt et al. 2013; Grigsby-Toussaint et al. 2015; Morita et al. 2011 proved mental health: astell-Burt et al. 2014; Bratman et al. 2014; Cohen-Cline et al. 2015; Gascon et al. 2015; Kim et al. 2009; Maas et al. 2009b; McEachan et al. 2016; Nutsford et al. 2013; Summ and Cohen 2014; Taylor et al. 2015; Uhite et al. 2013 teduced anxiety Beyer et al. 2014; Bratman et al. 2015; Minita et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013 eater happiness, well-being, life satisfaction Ambrey 2016; Fleming et al. 2016; Larson et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013 duced aggression Bogar and Beyer 2016; Branas et al. 2001; Faber Taylor and Kuo 2009; Paber Taylor and Kuo 2001; and Kuo 2001; b; Tory et al. 2012; Younan et al. 2014; Faber Taylor and Kuo 2009; Caber Taylor and Kuo 2009; Caber Taylor and Kuo 2001; Faber Taylor 2004; Markevych et al. 2013; Fan et al. 2011; Holtan et al. 2015; Horm et al. 2015; Barlans et al. 2015; Sullivan et al. 2004 reased prosocial behavior and social connectedness Proyle at al. 2011; Dadvand et al. 2014; Shanshan et al. 2004 wer blood pressure Duncan et al. 2015; Horm et al. 2014; Markevych et al. 2015; Barlans et al. 2016 proved prostive heart failure Mas et al. 2003; Cechtrai et al. 2014; Maso 2009; Ulrich 1984 proved congetive heart failure Kao 2011; Standers et al. 2015; Standers et al. 2016; Thering et al. 2016 proved child development (cognitive and motor) Fjortoft 2001; Kellert 2005 L	educed stress	Berto 2014; Fan et al. 2011; Nielsen and Hansen 2007; Stigsdotter et al. 2010; van den		
proved mental health: iceduced depressionAstell-Burt et al. 2014; Cohen-Cline et al. 2015; Gascon et al. 2015; Kim et al. 2009; Maas et al. 2009b; McEachan et al. 2016; Nutsford et al. 2013; Song et al. 2014; Taylor et al. 2015; White et al. 2013 Beyer et al. 2014; Taylor et al. 2015; Maas et al. 2009b; Nutsford et al. 2013; Song et al. 2013; Song et al. 2015 Mass et al. 2016; Larson et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013 Bogar and Beyer 2016; Bramas et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016 Amoly et al. 2014; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2016; Parson et al. 2016; Datward et al. 2016; Markevych et al. 2011; Fuor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014; yan den Berg and van den Berg 2011; Fuor et al. 2012; Piff et al. 2015; Sullivan et al. 2016; Pars and Mattson 2009; Parier taylor et al. 2014; Markevych et al. 2016; de Vries et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Proved pario et al. 2016; Markevych et al. 2016; de Vries et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Horne et al. 2016; de Vries et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Durcen et al. 2016; de Vries et al. 2016; de Vries et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Durcen et al. 2016; Durcen et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Durcen et al. 2016; Durcen et al. 2016; de Vries et al. 2016; Durcen et al				
deduced depressionAstell-Burt et al. 2014; Cheyer et al. 2014; Cohen-Cline et al. 2015; Gascon et al. 2015; Kim et al. 2009; McEachan et al. 2015; Musford et al. 2013; Sturm and Cohen 2014; Taylor et al. 2015; White et al. 2013deduced anxietyBeyer et al. 2014; Bratman et al. 2015; Maas et al. 2009; McEachan et al. 2015; Musford et al. 2013; Song et al. 2014; Bratman et al. 2015; Maas et al. 2009; McEachan et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2015; White et al. 2013duced aggressionAmbrey 2016; Fleming et al. 2015; White et al. 2013; Van Herzele and de Vries 2012; White et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016duced ADHD symptomsAmoly et al. 2014; Faber Taylor et al. 2017; Kou and Sullivan 2009; Paber Taylor and Kuo 2001; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011creased prosocial behavior and social connectednessBroyles et al. 2012; Piff et al. 2016; de Vries et al. 2011; Holtan et al. 2011; Holtan et al. 2015; Home et al. 2014; Shanahan et al. 2016wer blood pressureDuncan et al. 2017proved opative recoveryPark and Mattson 2008; Park and Mattson 2009; Ulrich 1984 Reviewed by Dzhambov et al. 2017proved congestive heart failure proved chaid development (cognitive and motor)Figrioff 2001; Kellert 2005proved diabetesAstell-Burt et al. 2015; Guard et al. 2016; Thiering et al. 2016 Heart al. 2015; Guard et al. 2013; Guage nheim et al. 2016; Thiering et al. 2016duced diabetesAstell-Burt et al. 2016; Chrise et al. 2014; Brown et al. 2016; Thiering et al. 2016 Frierhot et al. 2015; Guard et al. 2008; F. Diadvand et al. 2016; Thiering et al. 2016 Frierhot et al. 2016; Chrise et al. 2014; Brown et al	etter sleep	Astell-Burt et al. 2013; Grigsby-Toussaint et al. 2015; Morita et al. 2011		
Kim et al. 2009; Maas et al. 2009b; McEachan et al. 2016; Nutsford et al. 2013; Sturm and Cohen 2014; Taylor et al. 2015; White et al. 2013leduced anxietyBeyer et al. 2014; Bratman et al. 2015; Maas et al. 2009b; Nutsford et al. 2013; Song et al. 2014; Song et al. 2015; Maas et al. 2005; Nutsford et al. 2013; Van Herzele and de Vries 2012; White et al. 2013duced aggressionBogar and Beyer 2016; Branas et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016duced ADHD symptomsBogar and Beyer 2016; Branas et al. 2011; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014; braber and kuo 2001; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014; braber and wan den Berg 2011creased prosocial behavior and social connectednessBroyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004proved pressureDuncan et al. 2011; Markevych et al. 2014; Markevych et al. 2016proved birth outcomesReviewed by Dzhambov et al. 2014proved did development (cognitive and motor)Fjørtoft 2001; Kellert 2005proved diabetesAcutely (Diette et al. 2003; Lechtzin et al. 2016; Thering et al. 2016)duced diabetesAstell-Burt et al. 2014; Guegenheim et al. 2014; Brown et al. 2016; Thering et al. 2016uter evesightHatleburgproved general health:Joues et al. 2016; Guegenheim et al. 2015; Kark et al. 2016; Mas et al. 2006; Maas et al. 2009; Sigsdotter et al. 2008; Li et al. 2008; Li et al. 2001; Maas et al. 2006; Maas et al. 2006; Li et al. 2008; Li et al. 2001; Maas et al. 2016; Maas et al. 2016; Maas et al. 2016; Maas et al. 2016;				
and Cohen 2014; Taylor et al. 2015; White et al. 2013keduced anxietyBeyer et al. 2014; Bratman et al. 2015a; Maas et al. 2009b; Nutsford et al. 2013; Song et al. 2013; Song et al. 2015eater happiness, well-being, life satisfactionAmbrey 2016; Fleming et al. 2016; Larson et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013duced aggressionBogar and Beyer 2016; Branas et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Youman et al. 2016duced ADHD symptomsAmoly et al. 2014; Faber Taylor et al. 2001; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011reeased prosocial behavior and social connectednessBroyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004 Duncan et al. 2016; Markevych et al. 2014 Markevych et al. 2014wer blood pressure proved point outcomesPark and Mattson 2008; Park and Mattson 2009; Ulrich 1984 Reviewed by Dzhambov et al. 2014 Mac et al. 2017proved pain control duced obesityMao et al. 2003; Chellent 2005 Acutely (Diette et al. 2003; Lechtzin et al. 2010; Hen et al. 2016; Her et al. 2014; Brown et al. 2016; Thiering et al. 2016 Heil et al. 2008; Clelland et al. 2008; Lei et al. 2012; Hore et al. 2015; Maas et al. 2016; Maas et al. 2016; Heil et al. 2006; Li et al. 2003; Kardan et al. 2015; Maas et al. 2016 Her et al. 2016; Brown et al. 2016; Guegenheim et al. 2015; Maas et al. 2006; Maas et al. 2009; Stigsdotter et al. 2016; Wrees et al. 2015; Maas et al. 2006; Maas et al. 2009; Stigsdotter et al. 2016; Wrees et al. 2015; Maas et al. 2006; Maas et al. 2009; Stigsdotter et al. 2016; Hu et al. 2	Reduced depression			
teduced anxietyBeyer et al. 2014; Bratman et al. 2015a; Maas et al. 2009b; Nutsford et al. 2013; Song et al. 2015eater happiness, well-being, life satisfactionAmbrey 2016; Fleming et al. 2015; Larson et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013duced aggressionBogar and Beyer 2016; Branas et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016duced aggressionAmoly et al. 2014; Faber Taylor et al. 2001; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2001; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011creased prosocial behavior and social connectednessBroyles et al. 2011; Luo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg 2011creased prosocial behavior and social connectednessBroyles et al. 2011; Markevych et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2016wer blood pressureDuncan et al. 2014; Markevych et al. 2014; Markevych et al. 2014proved postoperative recoveryPark and Mattson 2008; Park and Mattson 2009; Ulrich 1984proved child development (cognitive and motor)Fjørtoft 2001; Kellert 2005proved child development (cognitive and motor)Fjørtoft 2001; Kellert 2005proved immune functionFjørtoft 2001; Guest et al. 2014; Brown et al. 2016; Thiering et al. 2016proved immune functionBeil et al. 2008; Cleland et al. 2014; Brown et al. 2016; Thiering et al. 2016proved general health:Stell-Burt et al. 2016; Guest et al. 2015; Maas et al. 2016; Maas et al. 2009; Vilaeneuve et al. 2016; Guest et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009; Sigsdotter et al. 2010; Ula				
et al. 2013; Song et al. 2015eater happiness, well-being, life satisfactionambrey 2016; Fleming et al. 2016; Larson et al. 2016; MacKerron and Mourato 2013; Van Herzele and de Vries 2012; White et al. 2013duced aggressionBogar and Beyer 2016; Branas et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016duced ADHD symptomsAmoly et al. 2014; Faber Taylor et al. 2001; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011greased prosocial behavior and social connectednessBroyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Miltwan et al. 2016wer blood pressure proved obreasure proved congestive heart failure proved congestive heart failure proved child development (cognitive and motor)Duncan et al. 2014; Markevych et al. 2014a; Shanahan et al. 2016 Park and Mattson 2008; P. Dadvand et al. 2016; Har et al. 2016; Mattson 2008; Cleland et al. 2003; Lechtzin et al. 2016; Thiering et al. 2016 Bell et al. 2008; Cleland et al. 2004; Brown et al. 2016; Thiering et al. 2016 French et al. 2013; Guggenheim et al. 2012; How et al. 2015; Maas et al. 2016; French et al. 2016; Ge Vries et al. 2005; Li et al. 2006; Li et al. 2008; Li et al. 2006; Maas et al. 2009; Sügsdotter et al. 2016; Maes et al. 2015; Maas et al. 2006; Maas et al. 2009; Sügsdotter et al. 2010; Wheeler et al. 2015; Maas et al. 2006; Maas et al. 2009; Sügsdotter et al. 2010; Wheeler et al. 2015; Takano et al. 2009; Sügsdotter et al. 2016; The et al. 2016; Takano et al. 2009; Sügsdotter et al. 2016; Couts et al. 2016; Maes et al. 2016; Takano et al. 2009; Sügsdotter et al. 2016; Davad et al. 2016; Takano et al. 2009; Sügsdotter et al. 2016; Davad et al. 2016; Takano et al. 20				
eater happiness, well-being, life satisfaction duced aggression duced ADHD symptoms creased prosocial behavior and social connectedness wer blood pressure proved birth outcomes proved postoperative recovery proved behavior and social connectedness duced dabetes duced diabetes duced diabetes duced diabetes duced diabetes duced minune function proved pirth cutiones duced mortality duced mortality	Reduced anxiety			
Van Herzele and de Vries 2012; White et al. 2013vduced aggressionBogar and Beyer 2016; Branas et al. 2011; Kuo and Sullivan 2001a, b; Troy et al. 2012; Younan et al. 2016vduced ADHD symptomsAmoly et al. 2014; Faber Taylor et al. 2011; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011creased prosocial behavior and social connectednessBroyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004 Duncan et al. 2014; Markevych et al. 2014; Shanahan et al. 2016 Park and Mattson 2008; Park and Mattson 2009; Ulrich 1984 Reviewed by Dzhambov et al. 2014 Mao et al. 2017 Fjørtoft 2001; Kellert 2005 Acutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016) Bell et al. 2008; Cleand et al. 2014; Brown et al. 2014; Lachowycz and Jones 2011; Sanders et al. 2015; Guggenheim et al. 2012; He et al. 2016; Thiering et al. 2016 French et al. 2013; Guggenheim et al. 2012; He et al. 2015; Li et al. 2006; Li et al. 2008; Li et al. 2008; Li et al. 2006; Li et al. 2015; Maas et al. 2016; Maas et al. 2009; Stigsdotter et al. 2016; Maas et al. 2016; Takano et al. 2016 Midren Midrenduced mortalityBrown et al. 2016; Courts et al. 2016; Mause et al. 2016; Takano et al. 2007; Villeneuve et al. 2016; Hu et al. 2008; James et al. 2016; Takano et al. 2000; Villeneuve et al. 2016; Mause et al. 2016; Takano et al. 2007; Villeneuve et al. 2016 Mortality et al. 2016; Dadvand et al. 2014; Fuertes et al. 2016; Takano et al. 2007; Villeneuve et al. 2016 Andrusaityte et al. 2016; Dadvand et al. 2014; Fuertes et al. 2016; Takano et al. 2007; Ville				
Younan et al. 2016 Amoly et al. 2014; Faber Taylor et al. 2001; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011 Broyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004 proved postoperative recovery proved birth outcomes proved birth outcomes proved bird development (cognitive and motor) proved pain control duced dobesity beduced diabetes strer eyesight proved immune function proved immune function proved immune function proved immune function proved immune function proved mortality dults ancer survivors Ancer survivors Ander sall/subber 2014 Shidren duced mortality thma and/or allergies (studies show both improvements	eater happiness, well-being, life satisfaction			
Amoly et al. 2014; Faber Taylor et al. 2001; Faber Taylor and Kuo 2009; Faber Taylor and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011broese et al. 2015; Home et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004wer blood pressure proved postoperative recovery proved congestive heart failure proved child development (cognitive and motor) proved pain control duced obesityproved bith outcomes duced diabetes ter eyesight proved general health: dultschacer survivors hildren chacer survivors hildrenchacer survivors hildren duced mortalitychacer survivors hildren chaced mortalitychaced mortalitychaced mortality chaced mortalitychaced mortality chaced mortalitychaced mortalitychaced mortality chaced mortalitychaced mortalitychample more more survivorschaced mortalitychaced mortality <tr< td=""><td>educed aggression</td><td></td></tr<>	educed aggression			
and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2014b; van den Berg and van den Berg 2011 Broyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2014 proved postoperative recovery proved birth outcomes proved birth outcomes proved congestive heart failure proved congestive heart failure proved congestive heart failure proved congestive heart failure proved pain control duced diabetes ther eyesight duced diabetes ther eyesight proved general health: dults and Kuo 2011; Kuo and Faber Taylor 2004; Markevych et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Hertes et al. 2014; Shanahan et al. 2014 Park and Mattson 2008; Park and Mattson 2009; Ulrich 1984 Reviewed by Dzhambov et al. 2014 Mao et al. 2017 Fjørtoft 2001; Kellert 2005 Acutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016) Bell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014; Lachowycz and Jones 2011; Sanders et al. 2015; Stark et al. 2014; Brown et al. 2016; Thiering et al. 2016 French et al. 2014; Brown et al. 2016; Thiering et al. 2016 French et al. 2013; Guggenheim et al. 2014; Brown et al. 2016; Thiering et al. 2016; Li et al. 2006; Li et al. 2008; Li et al. 2008; Li et al. 2008; Li et al. 2010; Li and Kawada 2011 Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2016; Coutts et al. 2016; Takano et al. 2002; Viileneuve et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2016; Takano et al. 2002; Viileneuve et al. 2016; Dadvand et al. 2014; Fuertes et al. 2014; Fuertes et al. 2016; Coutts et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2015; Matter et al. 2015; Matter et al. 2016; Takano et al. 2002; Viileneuve et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016; Coutts et al. 2016; Dadvand et al.				
van den Berg 2011 Broyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2014 Duncan et al. 2014; Markevych et al. 2014; Shanahan et al. 2016 proved birth outcomes proved congestive heart failure proved child development (cognitive and motor) proved pain control educed obesity beduced diabetes stuced diabetes ther eyesight proved general health: dults backer survivors cancer surviv	educed ADHD symptoms			
creased prosocial behavior and social connectednessBroyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004 Duncan et al. 2014; Markevych et al. 2014a; Shanahan et al. 2016 Park and Mattson 2009; Ulrich 1984 Reviewed by Dzhambov et al. 2014 Mao et al. 2017 Fjørtoft 2001; Kellert 2005 Acutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016) Bell et al. 2008; Cleland et al. 2014; Brown et al. 2014; Brown et al. 2016; Thiering et al. 2016 ti et al. 2008; Li et al. 2015; Stark et al. 2015 Li et al. 2008; Li et al. 2010; Li and Kawada 2011veduced insbetes tter eyesight proved immune function proved general health: dultsBrown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2016; Ge Vries et al. 2015; Maas et al. 2006; Maas et al. 2002; Villeneuve et al. 2016; Takano et al. 2002; Villeneuve et al. 2016; Dadvand et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012				
were blood pressureDuncan et al. 2014; Markevych et al. 2014a; Shanahan et al. 2016proved postoperative recoveryPark and Mattson 2008; Park and Mattson 2009; Ulrich 1984proved birth outcomesReviewed by Dzhambov et al. 2014proved congestive heart failureMao et al. 2017proved child development (cognitive and motor)Fjørtoft 2001; Kellert 2005proved pain controlAcutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016)duced obesityBell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz and Jones2011; Sanders et al. 2015; Stark et al. 2014Stell-Burt et al. 2014; Brown et al. 2016; Thiering et al. 2016proved general health:French et al. 2013; Guggenheim et al. 2010; Li and Kawada 2011udutsBrown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al.2009b; Stigsdotter et al. 2010; Wheeler et al. 2015Stardan et al. 2015; Maas et al. 2006; Maas et al.2009b; Stigsdotter et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al.2002; Villeneuve et al. 2010; Gascon et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016; Takano et al.2002; Villeneuve et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	creased prosocial behavior and social connectedness	Broyles et al. 2011; Dadvand et al. 2016; de Vries et al. 2013; Fan et al. 2011; Holtan		
proved postoperative recoveryPark and Mattson 2008; Park and Mattson 2009; Ulrich 1984proved birth outcomesReviewed by Dzhambov et al. 2014proved congestive heart failureMao et al. 2017proved child development (cognitive and motor)Fjørtoft 2001; Kellert 2005proved pain controlAcutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016)duced obesityBell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz and Jonesduced diabetesAstell-Burt et al. 2014; Bodicoat et al. 2014; Brown et al. 2016; Thiering et al. 2016there yesightFrench et al. 2013; Guggenheim et al. 2012; He et al. 2010; Li and Kawada 2011proved general health:It et al. 2006; Li et al. 2008; Li et al. 2008; Li et al. 2005; Maas et al. 2009; Stigsdotter et al. 2010; Wheeler et al. 2015ducted mortalityBrown et al. 2016; de Vries et al. 2013; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015ancer survivorsRay and Jakubec 2014'hildrenCoutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012whan and/or allergies (studies show both improvementsAndrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016; Takano et al. 2002; Villeneuve et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;		et al. 2015; Home et al. 2012; Piff et al. 2015; Sullivan et al. 2004		
proved birth outcomesReviewed by Dzhambov et al. 2014proved congestive heart failureMao et al. 2017proved child development (cognitive and motor)Fjørtoff 2001; Kellert 2005proved pain controlAcutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016)duced obesityBell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz and Jonesaduced diabetesAstell-Burt et al. 2015; Stark et al. 2014stuered immune functionFrench et al. 2013; Guggenheim et al. 2012; He et al. 2010; Li and Kawada 2011proved general health:Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al.2009b; Stigsdotter et al. 2010; Wheeler et al. 2015Ancre survivorsChildrenchuded mortalitycoduced mortality	ower blood pressure			
proved congestive heart failure proved child development (cognitive and motor)Mao et al. 2017proved child development (cognitive and motor) proved pain control educed obesityFjørtoft 2001; Kellert 2005 Acutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016) Bell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz and Jones 2011; Sanders et al. 2015; Stark et al. 2014educed diabetes etter eyesight proved immune function proved general health: dultsAstell-Burt et al. 2013; Guggenheim et al. 2012; He et al. 2010; Li and Kawada 2011Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 hildren children children chued mortalityBrown et al. 2016; de Vries et al. 2015; Maas et al. 2006; Maas et al. 2000; Stigsdotter et al. 2010; Wheeler et al. 2015 could be al. 2016; Takano et al. 2002; Villeneuve et al. 2016; Budvand et al. 2018; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012		Park and Mattson 2008; Park and Mattson 2009; Ulrich 1984		
proved child development (cognitive and motor)Fjørtoft 2001; Kellert 2005proved pain controlAcutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016)bell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz and Jonesbell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014; Lachowycz and Jonesbell et al. 2008; Cleland et al. 2015; Stark et al. 2014; Brown et al. 2016; Thiering et al. 2016bell et al. 2009; Cleland et al. 2014; Brown et al. 2016; Thiering et al. 2016bell et al. 2009; Li et al. 2013; Guggenheim et al. 2012; He et al. 2015; Li et al. 2006; Li et al. 2008; Li et al. 2010; Li and Kawada 2011proved general health:bell et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al.cancer survivorscancer survivorschildrenbeduced mortalitycduced mortalitycduced mortalitycduced mortalitychuma and/or allergies (studies show both improvements				
proved pain controlAcutely (Diette et al. 2003; Lechtzin et al. 2010) and chronically (Han et al. 2016)beduced obesityBell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014; Lachowycz and Jonesbeduced diabetes2011; Sanders et al. 2015; Stark et al. 2014beduced diabetesAstell-Burt et al. 2013; Guggenheim et al. 2014; Brown et al. 2016; Thiering et al. 2016better eyesightFrench et al. 2013; Guggenheim et al. 2012; He et al. 2010; Li and Kawada 2011proved general health:Li et al. 2006; Li et al. 2008a; Li et al. 2008b; Li et al. 2010; Li and Kawada 2011better survivorsBrown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015Cancer survivorsRay and Jakubec 2014ChildrenCoutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;				
duced obesityBell et al. 2008; Cleland et al. 2008; P. Dadvand et al. 2014a; Lachowycz and Jones 2011; Sanders et al. 2015; Stark et al. 2014duced diabetesAstell-Burt et al. 2015; Stark et al. 2014; Brown et al. 2016; Thiering et al. 2016 French et al. 2013; Guggenheim et al. 2012; He et al. 2010; Li and Kawada 2011 Diroved general health: dultsdultsBrown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Stigsdotter et al. 2010; Wheeler et al. 2015 Clust et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Clust et al. 2016; Clust et al. 2010; Wheeler et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Clust et al. 2016; Clust et al. 2016; Clust et al. 2016; Takano et al. 2002; Villeneuve et al. 2012Andrusaityte et al. 2016; Dadvand et al. 2014; Fuertes et al. 2014; Fuertes et al. 2016; Andrusaityte et al. 2016; Dadvand et al. 2014; Fuertes et al. 2016; Clust et al. 2016; Dadvand et al. 2014; Fuertes et al. 2016; Andrusaityte et al. 2016; Dadvand et al. 2014; Fuertes et al. 2016;				
2011; Sanders et al. 2015; Stark et al. 2014 Astell-Burt et al. 2014a; Bodicoat et al. 2014; Brown et al. 2016; Thiering et al. 2016 proved immune function proved general health: duduts Cancer survivors Children Seduced mortality Courts et al. 2016; Gascon et al. 2016; Hu et al. 2008; James et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Ray and Jakubec 2014 Kim et al. 2016; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012 Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;				
Atter eyesight iproved immune function iproved general health: dultsFrench et al. 2013; Guggenheim et al. 2012; He et al. 2015 Li et al. 2008a; Li et al. 2008a; Li et al. 2008b; Li et al. 2010; Li and Kawada 2011 Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2010; Maas et al. 2009b; Stigsdotter et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Ray and Jakubec 2014 Kim et al. 2016 Coutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	educed obesity			
proved immune function proved general health: dultsLi et al. 2006; Li et al. 2008a; Li et al. 2008b; Li et al. 2010; Li and Kawada 2011Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015Cancer survivors children duced mortalityRay and Jakubec 2014 Kim et al. 2016Coutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	educed diabetes	Astell-Burt et al. 2014a; Bodicoat et al. 2014; Brown et al. 2016; Thiering et al. 2016		
proved general health: dults Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Ray and Jakubec 2014 Kim et al. 2016 duced mortality Couts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012 Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	etter eyesight	French et al. 2013; Guggenheim et al. 2012; He et al. 2015		
dults Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al. 2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Cancer survivors Ray and Jakubec 2014 'hildren Kim et al. 2016; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012 'thma and/or allergies (studies show both improvements Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	proved immune function	Li et al. 2006; Li et al. 2008a; Li et al. 2008b; Li et al. 2010; Li and Kawada 2011		
2009b; Stigsdotter et al. 2010; Wheeler et al. 2015 Ray and Jakubec 2014 Kim et al. 2016 Sduced mortality Sduced mortality Stigsdotter et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012 Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	proved general health:			
Cancer survivorsRay and Jakubec 2014ChildrenKim et al. 2016Coutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	Adults	Brown et al. 2016; de Vries et al. 2003; Kardan et al. 2015; Maas et al. 2006; Maas et al.		
Children Kim et al. 2016 Educed mortality Coutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012 Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;		2009b; Stigsdotter et al. 2010; Wheeler et al. 2015		
duced mortality Coutts et al. 2010; Gascon et al. 2016b; Hu et al. 2008; James et al. 2016; Takano et al. 2002; Villeneuve et al. 2012 thma and/or allergies (studies show both improvements Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	Cancer survivors	Ray and Jakubec 2014		
2002; Villeneuve et al. 2012 Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;	Children			
	educed mortality			
nd exacerbations) Lovasi et al. 2013; Lovasi et al. 2008; Ruokolainen et al. 2015	sthma and/or allergies (studies show both improvements	Andrusaityte et al. 2016; Dadvand et al. 2014a; Fuertes et al. 2014; Fuertes et al. 2016;		
	nd exacerbations)	Lovasi et al. 2013; Lovasi et al. 2008; Ruokolainen et al. 2015		

Parks are a huge asset, and we need to value them for the 21st century *Alison Benjamin*

Our green spaces are shrinking, despite all the benefits they give us. If we want to save them, we need to value the ecosystem and health and wellbeing services they offer



Angel Meadow park, Manchester. Many small but vital 'green lungs' are being lost to development. Photograph: Ian Canham/Alamy

THE CONTINUES

Newcastle uses public health cash to save city parks

Jon Ungoed-Thomas

February 26 2017, 12:01am, The Sunday Times

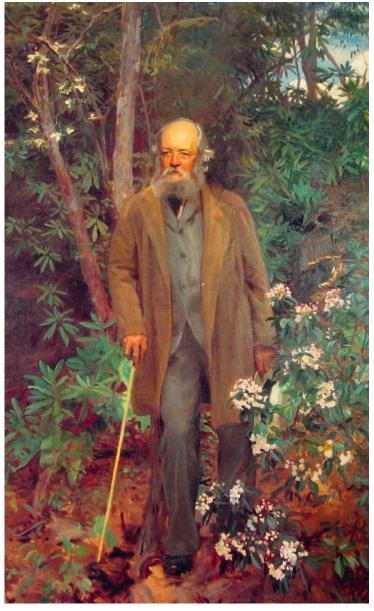


Leazes Park, Newcastle: the council says open spaces provide huge health benefits $\ensuremath{\mathsf{ALAMY}}$

Newcastle city council has become one of the first local authorities in Britain to use millions of pounds from its public health budget to help keep open its public parks.

The council says health budgets and NHS funds should be used to fund cash-strapped parks as such open spaces provide huge health benefits.

Precedent



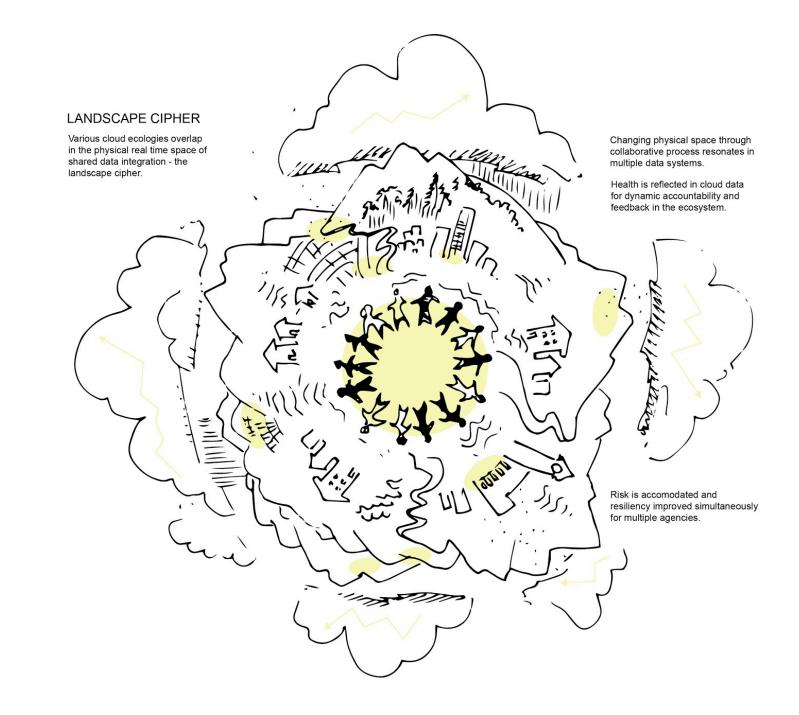
Frederick Law Olmsted



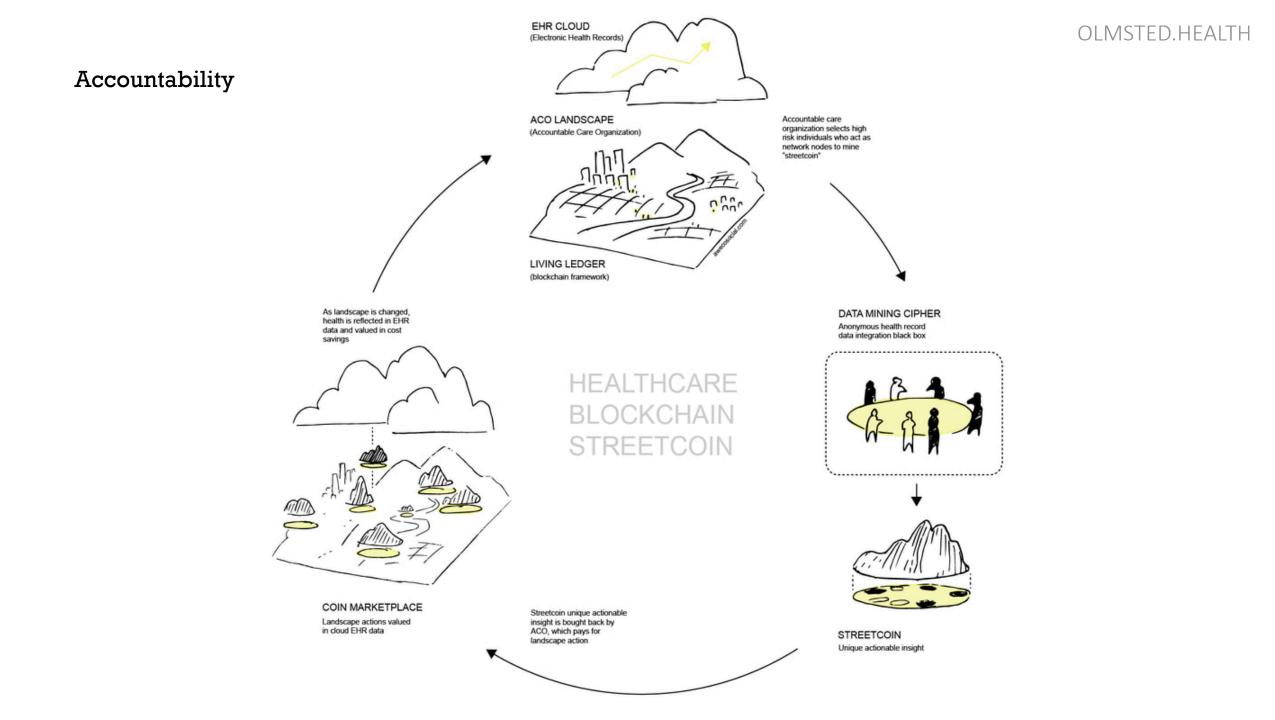
Smohalla

Olmsted.health

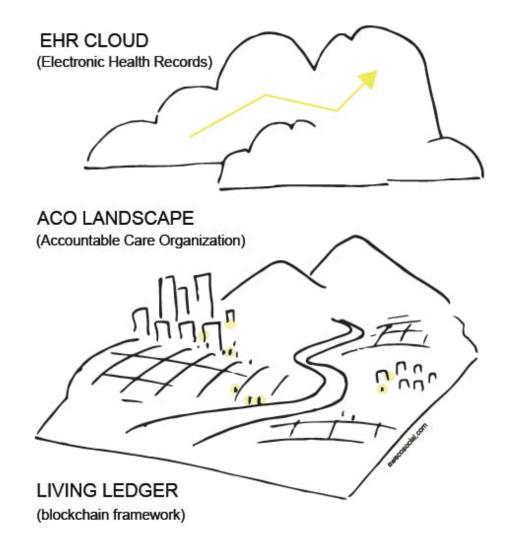
https://www.olmsted.health



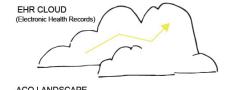
Stewardship



Healthcare EHR Clinician/Patient



Patient – Clinician View

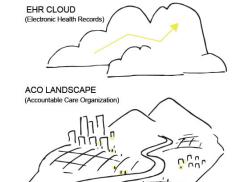




LIVING LEDGER (blockchain framework)



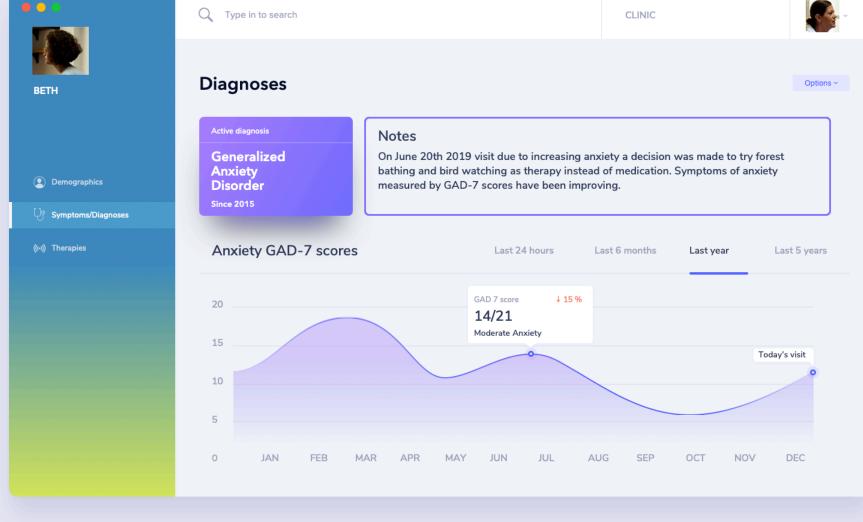
Physician view: patient story



LIVING LEDGER (blockchain framework)

BROOKLYN ACO	Q Type in to search		CLINIC	se -
ветн	Symptoms/Concer	'ns		Options ~
	Active diagnosis	Has had long standing anxiety that		
Demographics	Anxiety	seems to be getting worse increasingly due to pressures at school exacerbated		
다. 아이 Symptoms/Diagnoses	Since 2015	by social media based peer pressure.		
((··)) Therapies	Concern Family history of Type 2 diabetes Since 2015	Multiple family members have been diagnosed with type 2 diabetes, wonder what steps can be taken to prevent or delay condition.		
	Concern Excessive Screentime Since 2015	Patient and mother are concerned about her excessive time on her phon and feels that this is disrupting her sleep and other activities.	le	

Monitoring patient condition over time

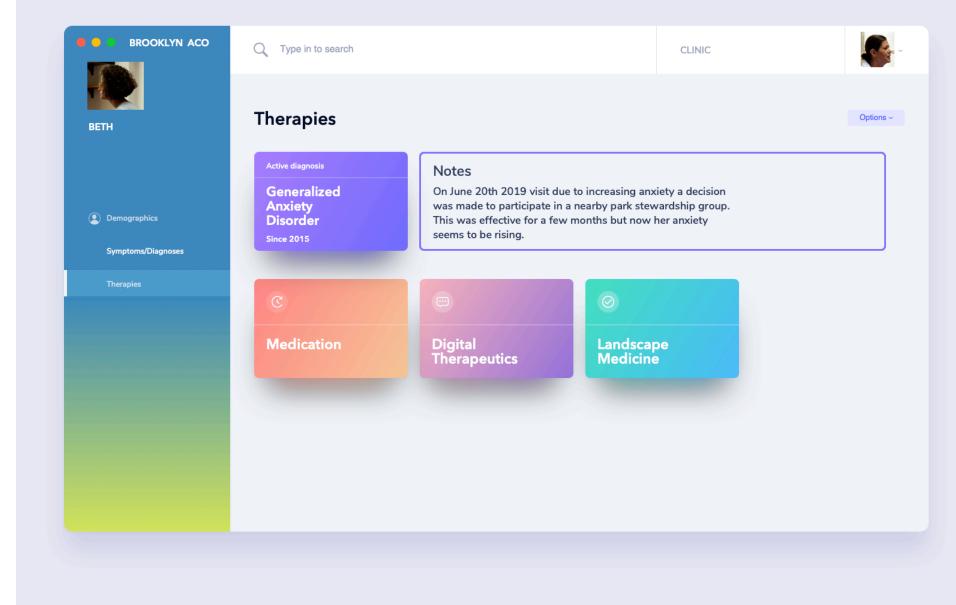




LIVING LEDGER (blockchain framework)

EHR CLOUD

Physician view: therapy selection





(blockchain framework)

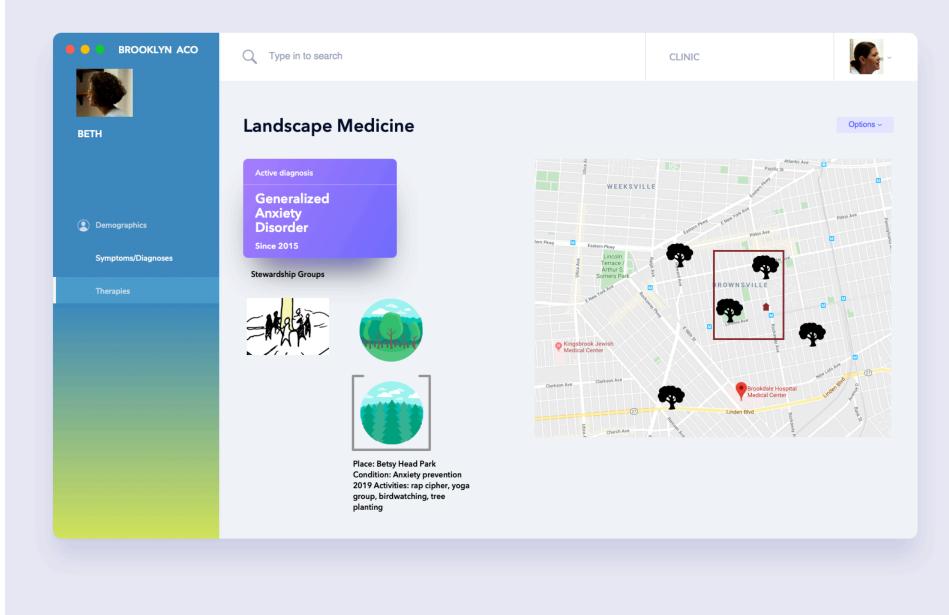
EHR CLOUD

Physician view: place selection





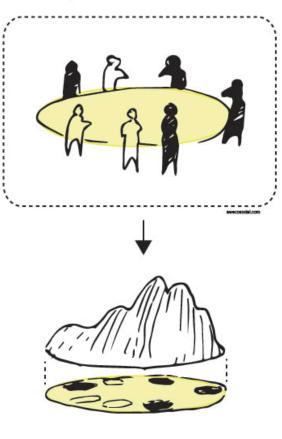
LIVING LEDGER (blockchain framework)



Stewardship group Landscape doctor

DATA MINING CIPHER Anonymous health record

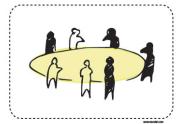


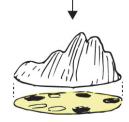


STREETCOIN Unique actionable insight

Landscape doctor – Stewardship group

DATA MINING CIPHER Anonymous health record data integration black box



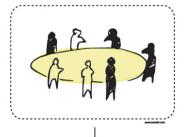


STREETCOIN Unique actionable insight



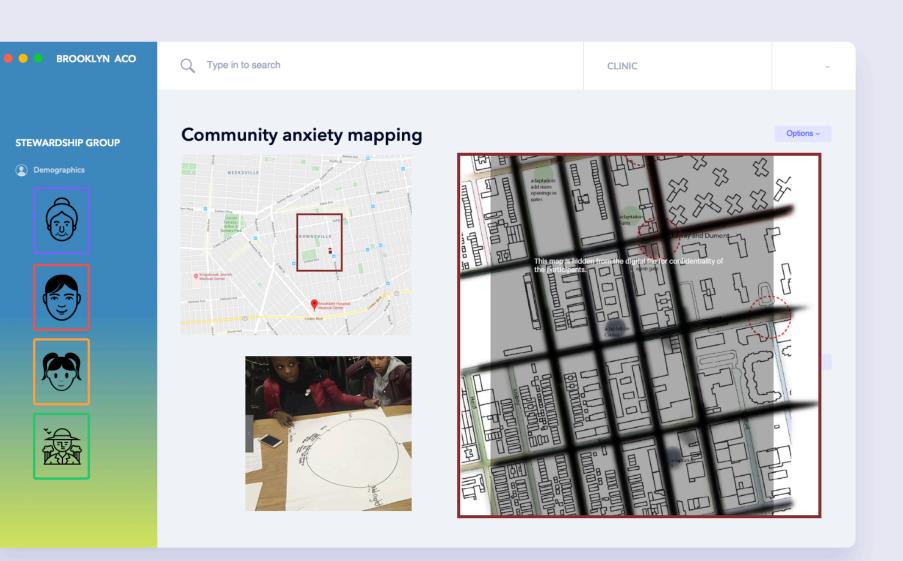
Landscape doctor view: Stewardship groups







STREETCOIN Unique actionable insight





Olmsted.health: Landscape doctor – stewardship group



Olmsted.health: Landscape doctor – stewardship group

Streetcoin Accountable Care Organization



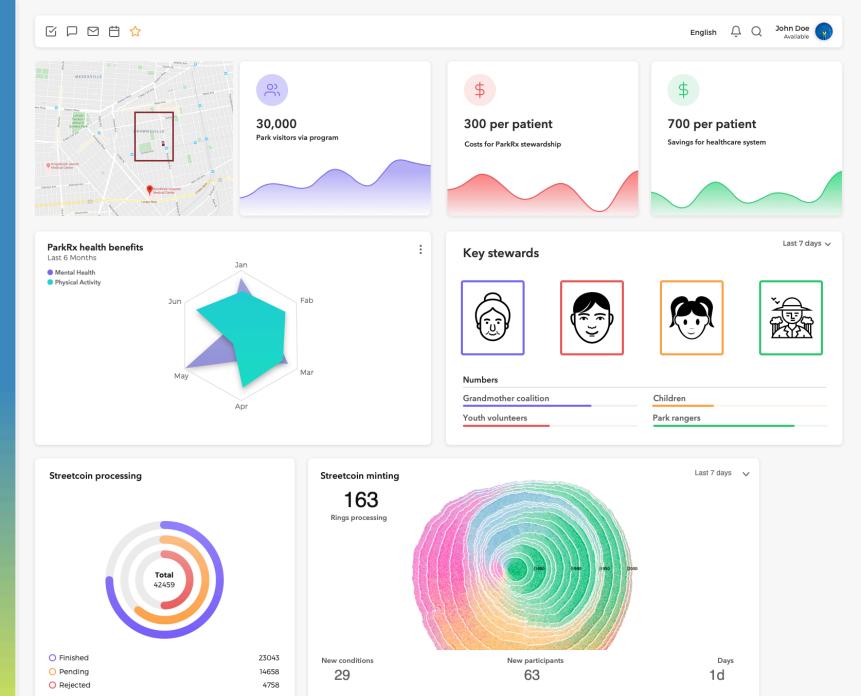
COIN MARKETPLACE Landscape actions valued in cloud EHR data Streetcoin Dashboard

• •

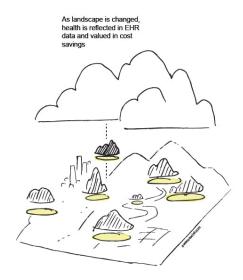
Accountable Care Organization view



COIN MARKETPLACE Landscape actions valued in cloud EHR data



Accountable Care Organization view

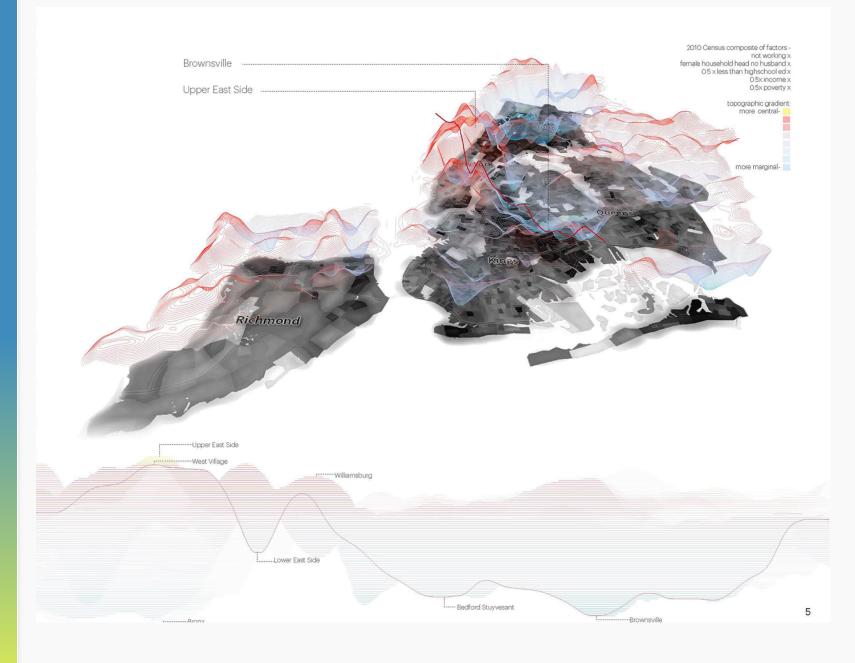


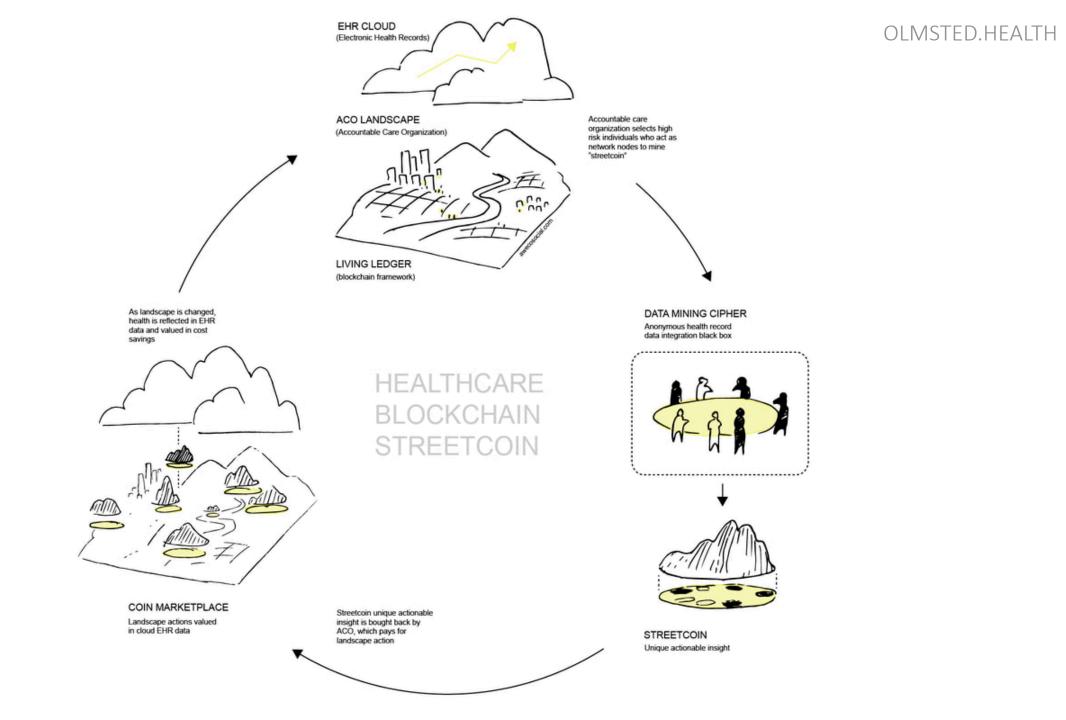
COIN MARKETPLACE Landscape actions valued in cloud EHR data

ビ 口 🖸 🕁

Streetcoin Dashboard







OLMSTED.HEALTH improving health outcomes with landscape medicine patient led adaptive management

