POPULATION APPROACHES TO HEALTH PROMOTION

What is the difference between 'scale-up', 'implementation science' and 'systems approaches' to physical activity

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Building pragmatic definitions – different terms, different purposes

Scale up

Implementation science

Systems approaches

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POPULATION APPROACHES TO PHYSICAL ACTIVITY

Making a difference to whole populations

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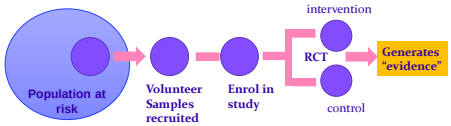
The evidence generation paradigm – why we don't usually make a population difference from research



Selection biases in people in those studies

- More educated, more advantaged
- Few disadvanted groups participate

→ ***Results are seldom generalisable***

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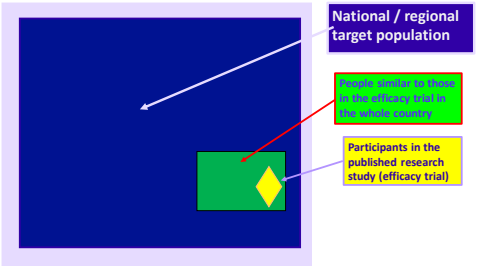

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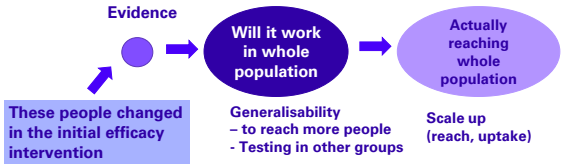
The most difficult challenge: *Translation of the evidence to reach populations*



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What is scale up?

Scaling up .....

"deliberate efforts to increase the impact of successfully tested health interventions to benefit more people and foster policy and sustained program development"

WHO, 2010

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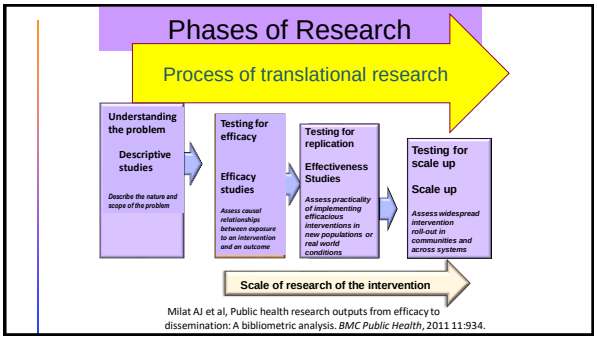

Milat AJ et al, Public health research outputs from efficacy to dissemination: A bibliometric analysis. *BMC Public Health*, 2011 11:934.

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Are physical activity interventions useful ?

The benefit of any public health intervention requires

Who is doing this ?

RESEARCHERS

POLICYMAKERS

Demonstrated Efficacy / Effectiveness

+

Adopted and Implemented at population level

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Common ways for scale up to occur

- **Spontaneous scale-up** – COVID scale up – vaccinations
  - *where the intervention **spread/diffuses spontaneously***
  - *Less effort needed to 'guide' or 'push' the scale-up along*
- **Deliberate or guided scale-up** – Most interventions
  - *where there is a deliberate plan for scale-up of an intervention to occur.*
  - *There are two common approaches in which this may occur*

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Deliberate PA Scale-up

Vertical scale-up

- **Simultaneous introduction across system**
- **policy or legislation**
- **Usually managed by government**
- **Systems and structures are adopted and resources set aside to build sustainability**

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Horizontal PA Scale up: "spread"

- **Program introduced in a phased manner**
- **Often begins in few sites, with step-wise increasing size and reach**
- **Also known as 'replication', 'expansion' or 'spread'**

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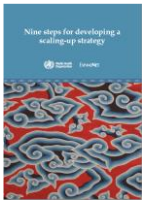
ExpandNET – World Health Organization

- Builds on Simmons & Shiffman's model
  (Simmons was an author on this publication)
- Emphasises that scaling up requires **systematic planning** and a *'careful balancing act between desired outcomes and practical realities and constraints'*
- Developed for those who plan to scale up successful tested interventions



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NSW Ministry of Health: Guide to scale-up

Step 1 Scalability assessment
- Assess effectiveness
- Assess potential reach and adoption
- Assess alignment with strategic context
- Assess acceptability & feasibility

Step 2 Develop scale-up plan
- Outline rationale for scale-up
- Conduct situational and/or stakeholder analysis and define roles
- Select approach to scale up
- Consider evaluation framework and resources required for scale-up
- Develop a scale-up plan

https://www.health.nsw.gov.au/research/Pages/scalability-guide.aspx

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NSW Ministry of Health: Guide to scale-up

Step 3 Prepare for scale-up
- Consult with Stakeholders
- Engage and develop ownership
- Build a community of practice
- Realign or mobilise resources

Step 4 Scale up the intervention
- Manage organisational change and processes
- Coordinate action and governance
- Monitor performance and efficiency
- Ensure sustainability

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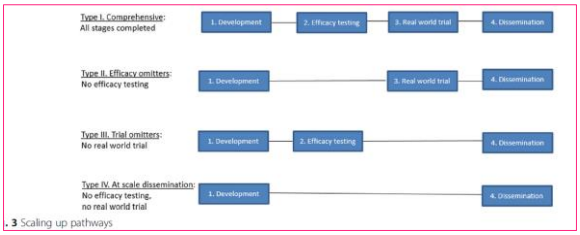
Reality of scale up – Four common pathways



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Example of comprehensive Scale-up: Action Schools! BC (Canada)

(McKay H, BJSM 2015)

Develop program	Efficacy testing	Replication (effectiveness)	Dissemination	Institutionalisation
2002 Action Schools BC (AS!BC) developed using socio-ecological theory and partnership in social change.	2003/04 Pilot cluster RCT, 10 schools (efficacy). A 'Healthy Eating' was later developed	2005-2007 Effectiveness of PA component tested in cluster RCT, 4 schools 2yrs. Efficacy conducted with 10 schools.	2008-2009 Funding from BC government for dissemination of AS!BC (2004/05) ~ 702 schools implemented the program. Implementation Evaluation @ 4 years with 120 schools	Post 2009 As part of institutionalisation guidelines for implementation developed for schools. Support team for schools and teachers.

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Reality of scale up – Four common pathways

Type 1: Comprehensive (55% of 40 interventions)

Development → Efficacy Testing → Real World Trial → Dissemination

Active Living Every Day (USA)

ALED program developed based on behaviour change theories	Randomised trial determined efficacy of ALED program	ALED program tested in community setting via translational trial	ALED program commercialised through partnership with Human Kinetics. Available for purchase

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Reality of scale up – Four common pathways

Type II: Efficacy Omitters (5% of 40 interventions)

Development → Efficacy Testing → Real World Trial → Dissemination

Project Energize (NZ)

- Project Energize designed as school-based nutrition and physical activity intervention
- 2004-2006 Conducted as a 2- year trial with all schools in the region being eligible to participate
- 2008 Was disseminated to all schools within the wider area.

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Four common pathways

Type III: Trial Omitters (25% of 40 interventions)

Development → Efficacy Testing → Real World → Dissemination

Managing Overweight/Obesity for Veterans Everywhere (MOVE) (USA)

- 2002 MOVE program developed by National Institute of Health & literature
- Piloted in 17 Veterans Health facilities & found to be effective
- 2006 Policy directive requiring MOVE to be implemented across all VHA facilities

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Four common pathways

Type IV: At scale dissemination (15 % of 40 interventions)

Development or "a good idea" → Efficacy Testing → Real World → Dissemination

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Scaling up – Quick summary

- **Important for making a change at population level**
- **Doesn't happen as often as it should OR not well documented**
- **Under researched** –descriptive & efficacy/ effectiveness research still dominates

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Intervention Scalability Assessment Tool

ISAT scored highly in degree of validity of content and evidence and moderately on methodological quality of the tool.

The ISAT was designed to:

- Assist in making assessment of scalability of an intervention
- Identify and assess contextual factors that may help or hinder scale up
- Be completed as a group

Milat A, Lee K et al 2020 Health Res Policy and Systems https://health-policy-systems.biomedcentral.com/articles/10.1186/s12961-019-0494-2

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Evaluation of scale up

The University of Sydney · The Australian Prevention Partnership Centre

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Scaling up Public Health Interventions can be COMPLEX and require comprehensive process and impact evaluation

COMPLEX PROGRAM (i.e. multiple program components)	COMPLEX TARGET POPULATION (i.e. variable stakeholder priorities)	COMPLEX SETTING (i.e. multiple factors influencing place)	COMPLEX EVALUATION DESIGN (i.e. multiple methods required)	COMPLEX OUTCOMES (i.e. multiple and variable program outcomes)

Bauman & Nutbeam, Evaluation in a Nutshell, 2022 in press

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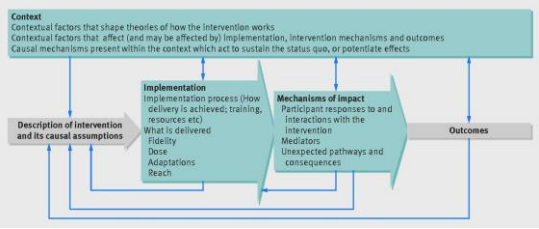
Evaluating scale up implementation

Guidance from the MRC, UK
(blue boxes are important components of process evaluation)

Moore et al. BMJ 2015;



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Collecting data on scale up evaluations

McKay BMC 2019:16:102

1. Context	*social, political, economic environmental influences*
2. Acceptability	*e.g. delivery team enthusiasm for the intervention*
3. Adaptability	*e.g. any tailoring of the intervention to local needs*
4. Feasibility	*e.g. can it be carried out in a given or org. or setting*
5. Appropriateness	*i.e. fit with delivery system, priorities, values*
6. Cost	*i.e. funds needed to be spent on scale up*
7. Culture	*e.g. delivery organisational culture*
8. Satisfaction	*e.g. delivery team satisfied with support received*
9. Complexity	*e.g. Complexity of the design or delivery method*
10. Self-efficacy	*e.g. skills and ability of the delivery team to deliver it*

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Things we may need to know about delivery outcomes

Adoption	what is the proportion and representativeness of the deliver orgs + end users/receiving the intervention
Dose received	the quantity of the intervention components delivered
Reach	who participates in the intervention, & how
Fidelity	has it been implemented as intended
Sustainability	how will the intervention (& individual behaviour change) continue

McKay BMC 2019:16:102

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SCALE UP

OR

IMPLEMENTATION SCIENCE

IMPLEMENTATION SCIENCE is researcher-led efforts to test optimal methods for implementing effective programs or research to understand implementation processes

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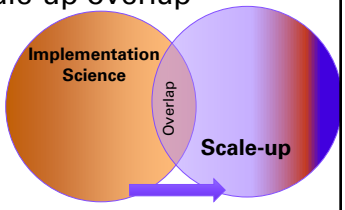
Impl. Sc. & Scale-up overlap

Using implementation strategies that work will facilitate scale-up

Ultimately, testing implementation strategies will improve uptake at a local level, which can be generalized to a broader level



Tested implementation strategies that work can facilitate scale-up

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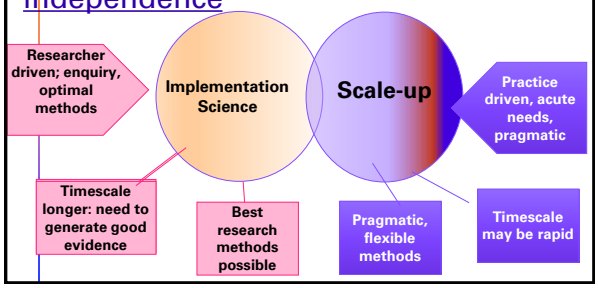
Implementation Science. & Scale-up independence



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Research model for scale up and implementation science

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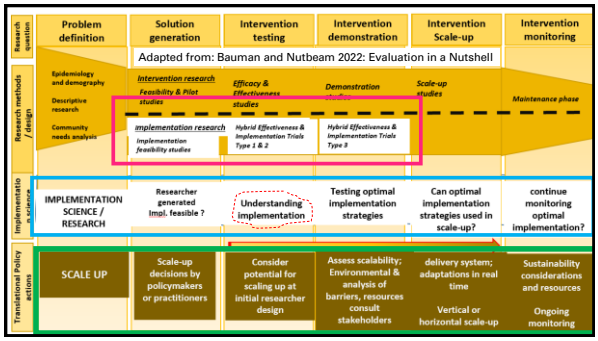

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Summary of scale up and implementation

- understanding where scale up fits in program evaluation, and some principles of evaluating scaled-up programs
- Preparing for scale up, contemplating scale up tools (ISAT) – is the program ready for scale up
- If you want to test different methods for implementing evidence based interventions – it will take more time – research methods from "implementation science"

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"Systems thinking"

Systems thinking : seeing the world in terms of the whole and its elements and their interrelationships

Paraphrased from Richmond, Barry. "Systems thinking/system dynamics: Let's just get on with it." *System Dynamics Review* 10.2-3 (1994): 135-157.

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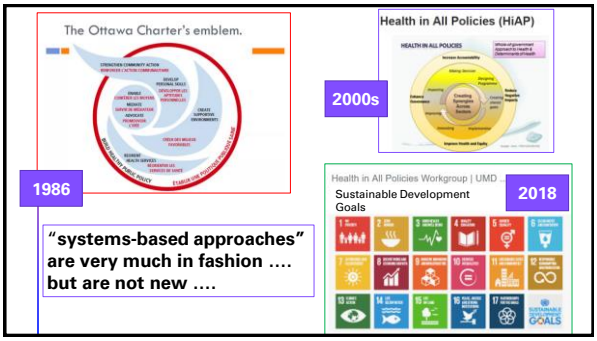

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Systems approaches to complex problems

- **Traditional research** and evidence generation **-->** isolating and testing interventions in small parts of 'system'
- **Systems thinking**
  - *taking many interactions into account*
  - *Recurring problems or where solutions not obvious*
  - *Issue affected by the environment surrounding the issue*

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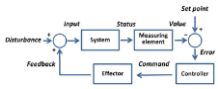
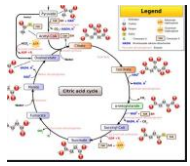
Systems



- **Parts are interdependent such a change in one part changes all parts**
- **The whole is greater than the sum of the parts**
- **Focus on interconnected relationships**
- **Systems are made up of sub-systems and function within larger systems**



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A bicycle is a system made up of many separate parts

No single part operates the system alone

The bicycle can only be ridden when all parts work together

The function of the system is different from the sum of the parts

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Systems approaches to PA

1. **Systems approaches to PA –working with complexity**
2. **Interrelationships and partnerships across agencies, sectors**
3. **We can "map a PA system", it is dynamic, and not linear**
4. **Change: system can be apparently stable or quiet and then suddenly things come together to "cause substantial change"**
5. **Needs responsiveness / flexibility / adaptability in change agents**
6. **This makes evaluation and research a real challenge …. even agreeing on the purposes of evaluation !**

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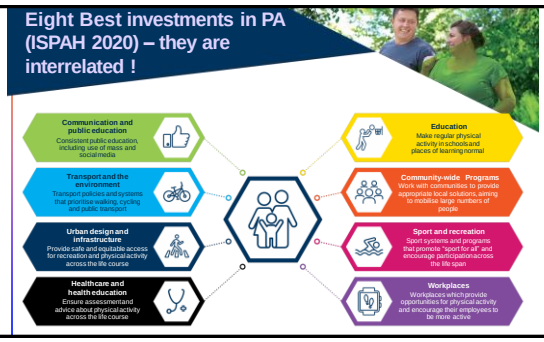

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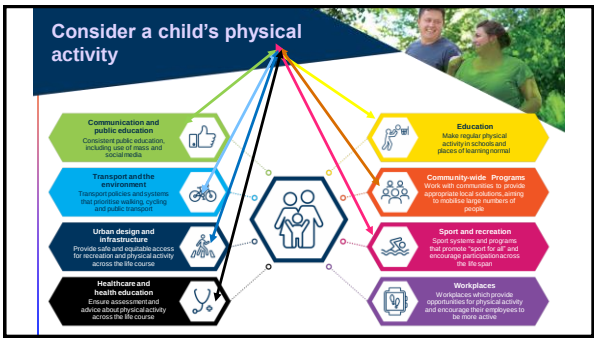

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Types of published systems research

1. **Planning a systems approach, map the system**
2. **Testing elements of a system; understanding stakeholders**
3. **Predictive modelling; systems dynamic, agent based models**
4. **Evaluating part of a system – often qualitative, realist methods – to understand how that part of the system "works"**
5. **Evaluation of a whole systems project – years, not months; complex program evaluation with multiple evaluable elements**

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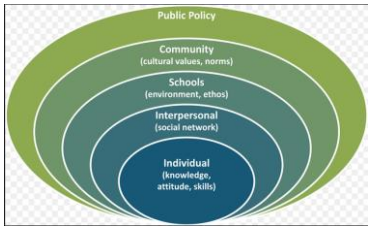
Social-Ecological Theory



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Causal Loop Diagrams
(bicycle commuting, Auckland)

In ST, Causal Loop Diagrams (CLD) can be thought of as building sentences within a story.

We identify the *key variables* in a system (the "nouns") and indicate the *causal relationships between them via links* (the "verbs").

By linking together several loops, we can create a concise story about a particular problem or issue.

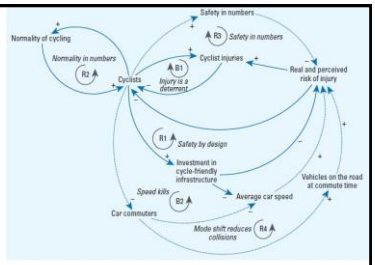

Figure 1. Causal loop diagram for bicycle commuting developed from stakeholder interviews and workshops, literature review, and data incorporation. Dotted lines denote loops identified by stakeholders and the literature, but where local data suggests they are currently inactive. Arrows with a positive sign (+) indicate that a change in the originating variable leads to a corresponding change in the variable at the arrowhead. Arrows with negative signs (–) indicate that a change in the originating variable leads to a change in the opposite direction for the arrowhead variable (R, reinforcing or positive feedback loop; B, balancing or negative feedback loop).

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THE NEW WHO GLOBAL ACTION PLAN ON PHYSICAL ACTIVITY 2018 – 2030

#GAPPA
#BEACTIVE

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Taking a systems approach

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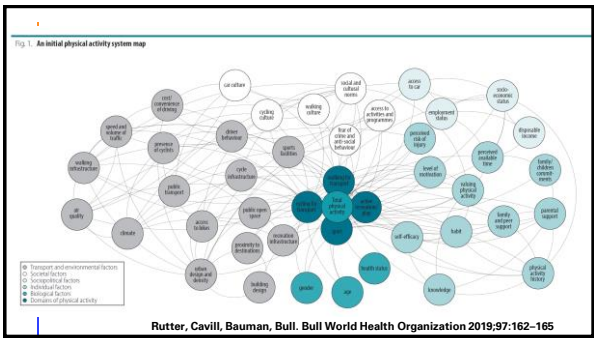

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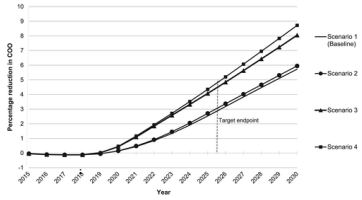
What are the hypothetical effects of different investments in preventive interventions

Dynamic Modelling here for community-interventions to reduce childhood obesity



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Observation and analysis of the pre-intervention context and the natural change processes

Understanding the system in which the intervention is planned:

- **Identifying the best settings to intervene**
- **what needs to be measured to understand observed effects**
- **Also explain unintended / unexpected effects**

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Conclusions

- Scale up is the design and evaluation of evidence based physical activity interventions delivered to large populations to increase the prevalence of meeting PA guidelines
- Implementation science informs best practice in scale up, but takes a longer time
- Systems approaches provide a more comprehensive view of the 'inactivity system' so that multi-sectoral approaches can be initiated

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- Prevention Research Collaboration at Sydney University (Karen Lee, Melanie Crane, Tracy Nau, Bill Bellew)
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