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A behavioral economics intervention to increase pertussis vaccination among infant caregivers: A randomized feasibility trial

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ABSTRACT

Objectives: The incidence of pertussis has tripled in the past five years. Infants can be protected by "cocooning," or vaccinating household contacts with the Tdap vaccine. However, Tdap coverage for adult caregivers of infants is low. This study evaluated the feasibility and impact of interventions informed by behavioral economics (retail pharmacy vouchers for Tdap vaccines and a celebrity public service announcement) to increase Tdap vaccination among caregivers of young infants.
Methods: We conducted a randomized controlled feasibility trial among adults attending newborn well-child visits at an urban Philadelphia pediatric primary care clinic who were not previously vaccinated with Tdap. Participants were randomized to one of four conditions: ($5-off Tdap voucher vs. free voucher)×(watching a 1 min video public service announcement (PSA) about Tdap vaccination vs. no PSA). Tdap vaccination was assessed by tracking voucher redemption and following up with participants by phone.
Results: Ninety-five adult caregivers of 74 infants were enrolled in the study (mean age 29.3 years; 61% male; relationship to newborn: 54% father, 33% mother, 13% grandparent or other; caregiver insurance status: 35% Medicaid, 34% private insurance, 32% uninsured). Only 1 subject redeemed the retail pharmacy Tdap voucher. Follow-up interviews suggest that, even with the voucher, significant barriers to vaccination remained including: delaying planned vaccination, perceived inconvenient pharmacy locations, and beliefs about pertussis risk and severity.
Conclusions: Despite leveraging existing infrastructure for adult vaccination, results suggest that retail pharmacy vouchers delivered during a newborn visit are not an effective strategy for promoting Tdap. Alternate approaches are needed that prioritize convenience and provide an immediate opportunity to vaccinate when motivation is high.

1. Introduction

Despite high pertussis vaccine coverage among children, pertussis incidence in the United States (US) has tripled in the past five years, peaking at 48,000 cases in 2012, the highest in 50 years [1–3]. Vaccination is the most effective strategy to prevent transmission; however, immunity wanes over time [4]. Incidence and risk of severe disease is highest in infants <6 months old (before completion of the primary vaccination series) who have up to 20-fold higher incidence of pertussis compared to the general population [5,6].

The majority (75%) of infants are infected by a household contact, most commonly by the mother (33%) or father (16%) [7,8]. To protect infants from pertussis, the Advisory Committee on Immunization Practices (ACIP) recommends maternal vaccination during

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each pregnancy to provide protective maternal antibodies perinatally. ACIP also recommends "cocooning," or vaccinating everyone who has contact with young infants, including parents, grandparents, siblings, and caregivers [9–11].

Implementation of cocooning has proved challenging [5,12], and recent data suggest Tdap coverage rates as low as 10% among adults who have close contact with infants [13,14]. Several barriers to Tdap vaccination of household contacts have been identified, including lack of awareness, limited access to Tdap vaccines, and inadequate funding and reimbursement for adult vaccinations, which are not routinely covered by private or public health insurance plans in the United States [14]. Interventions to vaccinate mothers and other caregivers in obstetrician offices and in the hospital during the postpartum period have had mixed results [15,16]. Recent attempts to promote and/or administer adult vaccines in pediatric settings have been limited by vaccine procurement and billing challenges, staff comfort in administering vaccines to adults, and record-keeping [14,17,18].

An underexplored venue for adult Tdap vaccination are retail pharmacies, which increasingly offer adult vaccination services and may be a particularly important resource for uninsured adults and those with limited access to health care services [19–21]. Tdap is widely available in retail pharmacies, but, at $50–$80 per dose, it is costly and rarely covered by insurance plans.

In this feasibility trial, we used insights from the field of behavioral economics to evaluate the potential for retail pharmacies to improve Tdap cocooning rates. Behavioral economics suggests novel approaches to addressing vaccination barriers. First, individuals are prone to *present bias*, meaning that they place more weight on immediate and tangible costs and benefits compared to future, uncertain costs and benefits [22]. Present bias may partially explain why adult caregivers of infants fail to get a Tdap vaccine: there are tangible and immediate costs (financial and time costs), while the perceived benefits (reduction of infant's pertussis risk) are uncertain and in the future. The second barrier to vaccination is limited attentional resources (or the capacity to give something one's attention). Given busy lives and competing priorities, vaccination must have high *salience*.

Our intervention targets the principles of present bias and salience through the use of retail pharmacy vouchers and a celebrity-delivered public service announcement (PSA) to increase Tdap vaccine uptake among adults accompanying young infants at their newborn visit. We address present bias by providing a Tdap vaccine voucher that can be used at a nearby retail pharmacy. The voucher reduces the financial cost of the voucher, while the provision of the vaccine at a neighborhood pharmacy reduces time costs. We increase the salience of vaccination by showing a video public service announcement stressing the importance of vaccination and the risk to infants of contracting pertussis. We selected a celebrity PSA to leverage the importance of celebrity reinforcement of social norms in forming behavioral intentions.[23,24] Informed by these behavioral economic principles, the objectives of this pilot study were to (1) assess the feasibility of delivering a voucher and video intervention in a pediatric clinic and a national retail pharmacy chain; and (2) evaluate the impact on caregiver vaccination of providing a voucher plus video intervention in a pediatric setting to guide the design of a future large-scale trial.

2. Patients and methods

2.1. Setting, subjects, and recruitment

We conducted a four-arm randomized feasibility trial in a large urban Philadelphia pediatric practice in collaboration with

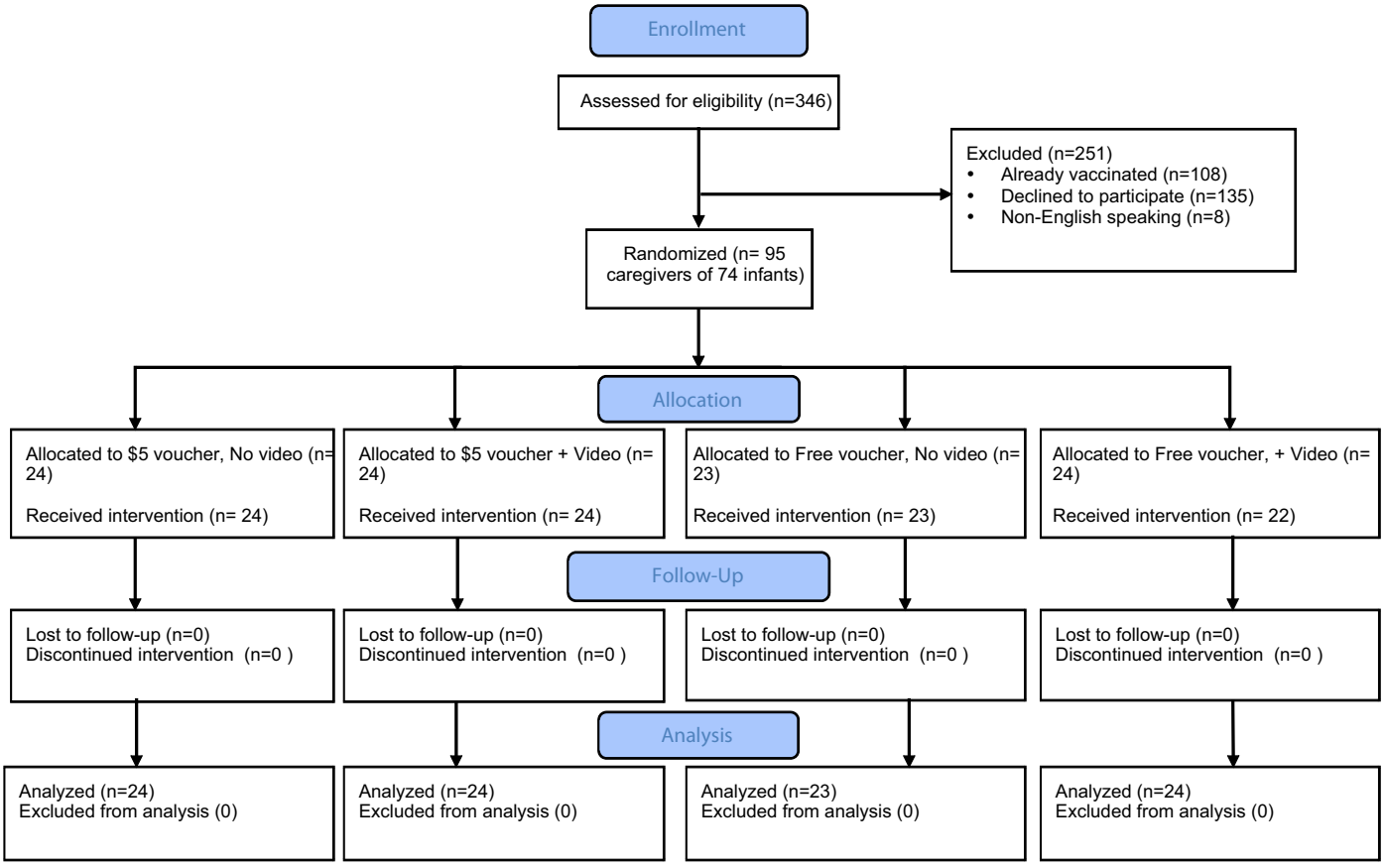

Fig. 1. Enrollment flow chart.