

1 **JHSPH Institutional Review Board**

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3 **RESEARCH PLAN**

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5
6 **PI: Allison Barlow, PhD**

7 **Study Title: Preventing Early Childhood Obesity, Part 1: Family Spirit Nurture, 3-9 Months**

8 **IRB No.: 7476**

9 **PI Version Number/Date: V8, 05-30-2018**

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12 **1. Aims of the Study:**

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14 This study aims to assess the impact of a brief home-visiting module, called “Family Spirit Nurture” (FSN), on American Indian (AI) parent feeding practices associated with increased risk for early childhood obesity, with a primary focus on delaying introduction of infants’ Sugar Sweetened Beverage (SSB) (including soda, energy drinks, juice with added sugar and other drinks with added sugar) intake while teaching mothers complementary feeding and responsive parenting practices. We will also assess how water insecurity may moderate parents’ feeding of SSBs to young children. Finally, we will explore whether maternal knowledge of oral health practices and/or reduction of infants’ SSB intake influences early indicators of infant’s oral health (i.e., infants’ oral microbiome and plaque formation). Our evaluation will employ a randomized controlled design, in which the control condition receives a beneficial home-safety educational model and assistance in safety proofing their homes for small children. Assessments in both groups will occur at baseline (between 0-14weeks postpartum) and 4 months, 6 months, 7 months, 8 months, 9 months and 12 months postpartum.

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28 Primary Aims:

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30 **Aim 1:** To determine the effectiveness of the brief (6 lessons) FSN home-visiting parent feeding practice module on reducing SSB initiation and frequency among infants between 3 and 12 months of age. **Hypothesis 1:** Infants whose mothers receive FSN vs. controls will be less likely to introduce SSBs between 3 and 12 months of age.

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35 **Aim 2:** To determine the effectiveness of FSN to promote optimal complementary feeding and responsive parenting practices. **Hypothesis 2:** Mothers who receive FSN vs. controls will be more likely to practice recommended complementary feeding and responsive parenting practices between 3 and 12 months of age.

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40 **Aim 3:** To determine the impact of water insecurity on SSB consumption among infants between 3 and 6 months of age. **Hypothesis 2:** Parents who report water insecurity vs. those who do not will be more likely to give infants SSBs between 3 and 6 months of age.

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44 Secondary Aims:

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46 **Secondary Aim 1:** To explore if provision of water to families reduces SSB intake among mothers and infants ages 6 to 9 months of age.

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49 **Secondary Aim 2:** To explore if infants in the FSN intervention have better oral health outcomes than control infants up to 12 months postpartum.

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2. Background and Rationale:

Epidemiology of American Indian Childhood Obesity

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56 Childhood obesity has more than doubled among children in the past 30 years¹². In the first part
57 of the 2010s, 8.9% of 2-5 year olds in the United States were overweight or obese and 2% were
58 extremely obese³. Reservation-based American Indian (AI) children suffer the highest rates of
59 early childhood obesity and related lifetime consequences of any racial or ethnic group in the
60 US⁴. Among AIs, disparities in overweight begin at birth. A greater percentage of AI women
61 give birth to large-for gestational age (LGA) babies than women of all other races/ethnicities⁵. In
62 2012, 12.5% of AI infants and 23.8% of toddlers were obese compared with 10.2% of infants
63 and 16.0% of toddlers of other races/ethnicities. AI obesity rates continue to rise with age: in
64 2012, 41.2% of AI preschoolers were obese compared to 30.2% of all other races/ethnicities⁶.
65 Early life obesity translates to formidable chronic disease—especially cardiovascular disease
66 (CVD) and diabetes⁷⁻⁹. CVD, once rare among AIs, now exceeds rates in other US populations
67 and is more often fatal¹⁰. Further, diabetes has emerged as a public health issue among AI
68 youth. In 2009, diabetes rates among AI youth ages 10-19 were 2.6 times higher than the US all
69 races/ethnicities rate and 7.0 times higher than the non-Hispanic White youth rate¹¹

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The Role of SSBs, Feeding Practices and Water Insecurity in Childhood Obesity

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73 The rise in obesity can be attributed to many factors including early life feeding behaviors and
74 environment. Sugar Sweetened Beverages (SSBs), play a key role in early childhood obesity¹²
75 ¹³. Children introduced to SSBs before 6 months of age are 92% more likely to be obese at age
76 6. Those who consume >3 SSBs per week at 10-12 months of age have twice the obesity rate
77 as children who consume no SSBs¹⁴. Overweight/obese 2-to-5-year-old AI children consume
78 51% more SSBs than their normal-weight AI counterparts^{15,16}. Prior studies conducted by the
79 research team on Navajo Nation indicate high infant SSB consumption within the participating
80 Navajo research community: at 6 months postpartum, 46% of Navajo mothers reported they had
81 fed their infants SSBs; and 87% by 12 months (unpublished data).

82

83 In addition to reducing children's SSB consumption, optimal complementary and responsive
84 feeding confers additional obesity protection in early life. Studies indicate early introduction of
85 complementary foods (< 6 months of age) increases infants' risk of obesity^{17, 18,19}. Similarly, non-
86 responsive feeding styles—characterized by excessive control (e.g. force or restriction),
87 indulgence, or non-involvement—are associated with low child self-regulation of intake²⁰.
88 ²¹.(CITE) Benefits of responsive feeding include: children's increased attention to internal
89 signals of hunger and satiety and reduced risk of rapid weight gain and pediatric obesity^{22-24 25}

90

91 The environment, primarily access to clean, safe and acceptable drinking water may contribute
92 further to the consumption of SSBs and obesity among children. Studies among adolescents
93 and adults have shown that when there is a lack of potable water, individuals consume more
94 SSBs^{26,27 28,29}. However, the relationship between SSB intake and water security among infants
95 and young children is not well studied. Recent estimates suggest that up to 40% of Navajo
96 families lack access to clean, safe drinking water³⁰. This study will explore the relationship
97 between household water security and SSB introduction in infants living on the Navajo Nation.

98

The Role of SSBs in Oral Health

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101 Consumption of SSBs also contributes to poor oral health. Tooth decay is the most prevalent
102 dental disease of childhood and 62% of American Indian children 2-5 years have tooth decay,
103 which is four times higher than US white children³¹ Eighty-six percent of Navajo children 2-5
104 years of age have tooth decay experience according to the 2010 IHS Oral Health Survey, which
105 is the highest among all IHS Areas. A recent oral health promotion study among Navajo 3-year
106 olds attending Head Start revealed that that 90% of children had caries at baseline with an
107 average of 18.2 tooth surfaces identified as decayed, missing (due to caries) or filled (dmf). By
108 five years of age, 98% had decay experience and an average of 37.5 dmf tooth surfaces^{32, 33}.
109 At least 60% of Navajo 3-year olds enrolled in the Head Start study had decay present on the
110 maxillary (upper) incisors, which are among the first teeth to erupt and experience significant
111 exposure to cariogenic liquids such as SSBs taken from a bottle or sippy cup³³
112

113 Severe decay has serious and long-lasting health consequences such as higher healthcare
114 costs, pain, infection, delayed speech development in children, lower self-esteem, poorer
115 performance in school, and poorer oral health outcomes in adults. Tooth decay is caused when
116 oral bacteria metabolize carbohydrates and release acid onto the tooth surface as a byproduct.
117 More frequent exposure to dietary carbohydrates (e.g., sugars) leads to excessive release of
118 acid onto the tooth surface and selects for oral bacteria that thrive in an acidic environment and
119 are the key contributors to acid production³⁴. AI children have several biological risk factors that
120 place them at higher risk of developing caries due to early intake of SSB including earlier tooth
121 eruption and a greater number of teeth present at SSB initiation³⁵. Education-based
122 interventions such as FSN that focus on improved infant feeding practices to minimize
123 consumption of SSBs have effectively reduced caries prevalence in other populations. These
124 reductions are presumably mediated by changes in the oral microbiome³⁶. Data collection from
125 this trial will inform future intervention development and studies of oral health outcomes among
126 AI children.

127 Participating Community

128 The Shiprock community, where this program will be implemented, is located in northwestern
129 New Mexico and part of the Northern Agency of the Navajo Nation. The Northern Agency
130 extends into Arizona, New Mexico and Utah and is home to ~30,000 tribal members. There are
131 approximately 175,000 people living on the Navajo Nation and 33% of all tribal members are
132 under the age of 18. The average household size on the Navajo Nation is 3.5 persons. Married
133 couple families make up 39% of households and 26% of households are headed by single
134 mothers. 14.7% of households on the Navajo Nation are multi-generational and the median
135 household income for the Navajo Nation is \$27,389. Poverty rates on the Navajo Nation (38%)
136 are more than twice the poverty rate in Arizona (15%). Almost half (44%) of children <18 years
137 are living in poverty.
138
139

140 **3. Study Design**

141 *A. Provide an overview of your study design and methods.*

142 Overview of Study Design

143 We will conduct a pilot randomized 1:1 controlled trial with 136 mother-infant dyads randomized
144 to either intervention or control. Participants will be pre-screened for water insecurity and
145 distributed equally across the two study arms using stratified block randomization. The
146 intervention group (n=68) will receive the FSN home-visiting module, consisting of six 45-minute
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151 lessons delivered biweekly by trained local AI Family Health Coaches (FHCs), from 3 to 6
 152 months postpartum. The lessons focus on elimination or reduction of Sugar Sweetened
 153 Beverages (SSBs) among infants while teaching mothers complementary feeding and
 154 responsive parenting practices. The control group (n=68) will receive three home-based lessons
 155 with home safety information (injury prevention is a priority identified by Navajo leadership that
 156 does not interfere with study questions). All families will receive delivery of drinking water from 6
 157 to 9 months postpartum. Through this staggered design, we will evaluate the impact of the FSN
 158 on infant feeding practices associated with increased risk for early childhood obesity, with a
 159 primary focus on delaying introduction of infant's SSB intake. We will also be able to evaluate
 160 the impact of the availability of potable water on SSB intake, with or without family education. In
 161 addition, participants will have the opportunity to provide additional consent for a nested oral
 162 health study to evaluate the impact of the FSN curriculum and water provision on infant oral
 163 health indicators.

164 Methods:

165 Study implementation will include four phases (Figure 1):

166 **Phase 1 (Referral, Recruitment, Consent, Baseline Assessment and Randomization):**

167 Potentially eligible mothers will be referred to our study staff, who will screen for eligibility,
 168 consent/assent mothers, conduct baseline assessment, and assign randomization status.
 169 Randomization will be assigned after the completion of the baseline assessment, including
 170 scoring of the participant's water insecurity status. Two randomization lists (one for water secure
 171 mothers and one for water insecure mothers) will be created prior to study initiation using
 172 STATA 14 statistical software³⁷.

173
 174
 175 **Part 2 (Home-Based Education Intervention):** Local FHCs, trained and employed by Johns
 176 Hopkins, will deliver either the intervention (6-session FSN) or the control condition (3- Home-
 177 Safety Lessons) between 3 to 6 months postpartum.

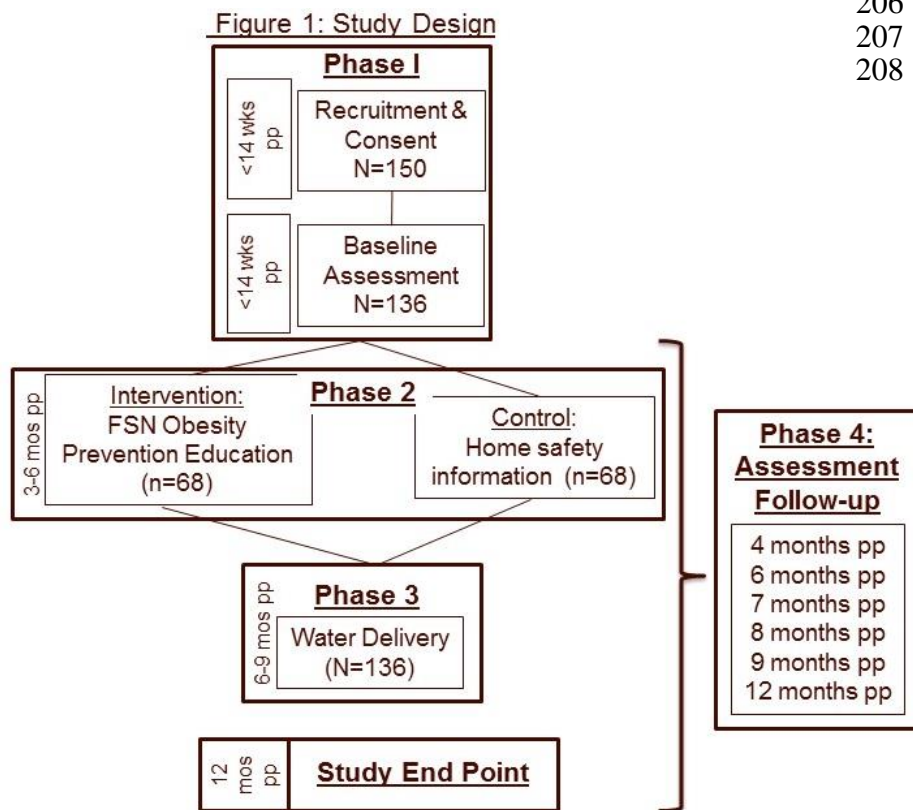
178
 179 **Part 3 (Water Delivery):** All participants will have drinking water delivered to their home from 6
 180 to 9 months postpartum. FHCs will deliver water either weekly or less often, depending on
 181 needs of family. The amount of water delivered will be based on number of adults and children
 182 residing in home during this period of the study.

183
 184 **Part 4 (Assessment):** Our assessment post-baseline consists of a mixed-methods
 185 assessment, including maternal self-reports and maternal FHC-administered interviews
 186 collected using REDCap at 4, 6, 7, 8, 9 and 12 months postpartum and maternal and infant
 187 medical chart reviews. If consent is given for the nested oral health study, the additional
 188 assessments will include a maternal self-report measure, collection and microbiologic testing of
 189 infant plaque and saliva, an infant oral examination, tooth eruption evaluations and infant
 190 medical and dental chart reviews.

191
 192 *B. Provide sample size and a clear justification as to how you arrived at your projected*
 193 *sample size.*

194 We aim to consent 150 mothers of infants 0-14 weeks of age, with the goal of 136 mothers
 195 completing a baseline assessment and being randomized to either intervention or control.
 196 Sample size and statistical power estimates were based on the primary hypothesis that the FSN
 197 intervention will decrease the introduction and frequency of SSBs among infants between 3 and
 198 12 months of age. The primary outcome we used for determining sample size was "percent ever
 199 introduced SSBs at the endpoint of the study (12 months postpartum)". A sample size of 136
 200 mother-infant dyads, or 68 per study arm, will be needed to detect a 24% between group

201 difference (FSN vs. control), taking into account an estimated 10% attrition at 12 months
 202 postpartum (based on the previous Family Spirit trial, with 80% power and significance level of
 203 5%³⁸. The sample size is also powered to detect meaningful between-group differences in: a)
 204 mean maternal knowledge scores; b) percent introduced complementary foods at 6 months of
 205 age; and c) mean scores on responsive feeding scale (see Table 2). Sample sizes and power
 206 were calculated
 207 using Stata 14's
 208 power command.³⁷
 209



210 4. Participants:

211 The study will engage self-identified AI mothers of an infant between 0 and 14 weeks postpartum
 212 living in the Northern Navajo Medical Center catchment area. Approximately 80,000 AIs seek
 213 care at Northern Navajo Medical Center, with approximately 650 births per year (unpublished
 214 data from Navajo Medical Center)

215 Inclusion Criteria:

- 216 1. American Indian ethnicity
- 217 2. Female
- 218 3. 13 years of age or older
- 219 4. Mother to a baby between the ages of 0 and 14 weeks
- 220 5. Living within 50 miles of the Northern Navajo Medical Center

221 Exclusion Criteria:

224 1. Inability to participate in full intervention or evaluation (e.g., planned move, residential
225 treatment, etc.)

226 2. Unwilling to be randomized

227 Potential participants will be screened for satisfaction of these eligibility requirements as they
228 are recruited into the study (see Recruitment Section below).

229

230 **5. Study Procedures:**

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232 A. *Recruitment Process:*

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234 1. *Describe how you will identify, approach, and inform potential participants about*
235 *your study. Include details about who will perform these activities and what their*
236 *qualifications are.*

237

238 Subjects will be recruited from OB/GYN and pediatric clinics, WIC programs, and word of
239 mouth. Allied clinical and service staff at the recruitment (for example, doctors, nurses, WIC
240 providers) will talk with the mother about the study. If she is interested in learning more about
241 the study, providers will complete a **provider referral form** and send it to the study team.
242 Potential participants may also complete the **self-referral form** and drop it in the locked drop-
243 box in the clinic waiting room. In addition, study staff may be present in the waiting room to
244 provide potential participants with more information about the study. Providers in relevant health
245 and human service settings (OB/GYN clinics, pediatric clinics, WIC programs) will receive
246 regular in-services and reminders from our study staff on the study protocol; participant eligibility
247 criteria and study progress. Staff will also put a flag in the charts of potentially eligible
248 participants to help providers remember to discuss the study with the patient.

249

250 We will also use the local media to recruit interested participants. We will publish a print add in
251 the local newspaper, complete radio public services announcements and post flyers in places
252 frequently used by potential participants (grocery stores, clinics, WIC offices). All promotional
253 materials will be approved JHSPH IRB.

254

255 If we have recruitment challenges, we may also use community gatherings, such as health and
256 jobs fairs, which are often attended by Johns Hopkins field staff. The Johns Hopkins Shiprock
257 field site run a variety of studies and service projects in the tribal communities selected for this
258 study.

259

260 In addition, we have requested a waiver of HIPAA Authorization to be used for recruitment of
261 study participants. In order for the study staff to identify potentially eligible women during the
262 recruitment process, we need to identify women that fit the study's eligibility criteria. The waiver
263 will allow the study staff to obtain demographic information from potential participants' electronic
264 health records and clinic visit sign-in and appointment logs at the participating health clinic.
265 Study staff will only access the records described in the research application and the waiver of
266 HIPAA Authorization. We have determined during the first few months of study implementation
267 that recruitment via provider referrals and self-referrals misses a good number of potentially
268 eligible participants who could benefit from the study. Access to electronic medical records and
269 appointment logs will enable study staff to directly contact potentially eligible participants to see
270 if they may be interested in the study.

271

272

273 Once a referral is made (either by a community provider or self-referral), a trained study staff
 274 member will contact the potential participant and use a script to explain details of the study,
 275 verify the individual's interest in participating, and make sure they meet all eligibility criteria. If
 276 interested, the study staff member will collect information utilizing the initial contact form, set up
 277 an appointment to meet with her (and her guardian if she is 13-17 years of age) to explain the
 278 study in further detail and carry out an informed assent/consent process.

279
 280 All recruitment activities will be completed by trained Johns Hopkins employees. All study staff
 281 will be trained in human subject's research and will be required to complete the CITI ethics and
 282 HIPAA modules prior to any interaction with participants or study data. Certificates of training in
 283 human subject's research are kept on file at the Center for American Indian Health's office in
 284 Baltimore.

285
 286 *2. Address any privacy issues associated with recruitment. If recruitment itself may*
 287 *put potential participants at risk (if study topic is sensitive, or study population*
 288 *may be stigmatized), explain how you will minimize these risks.*

289 **B. Consent Process:**

290 *1. Describe the following details about obtaining informed consent from study*
 291 *participants. If a screening process precedes study enrollment, also describe the*
 292 *consent for screening.*

293
 294 Study staff will obtain informed written consent from all minor and adult participants.

295
 296 The informed consent process will be administered in a confidential location convenient to the
 297 participant (e.g., clinic room, project office, participant's home).

298
 299 During the consent process, program staff will explain the study to participants, including study
 300 procedures, risks and benefits associated with participating in the study and the rights and
 301 responsibilities of study participants. Staff will encourage participants to ask questions and will
 302 also ask the participant to explain the study in their own words to ensure that they understand
 303 the purpose of the study, their participation, and the risks and benefits. Study staff will allow the
 304 participant an appropriate amount of time to consider whether they want to participate and to
 305 ask questions. If the participant appears reluctant or uninterested, staff will encourage them to
 306 ask questions and will answer all questions thoroughly. If the participant is not interested, staff
 307 will thank them for considering the study and leave. If the participant is clearly knowledgeable
 308 and interested in participating in the study, staff will have the participant sign and date the
 309 consent form. After that, the staff member will sign and date the consent form. The participant
 310 will be given a copy of the consent form and the original will be kept in the participant's
 311 confidential record in a locked study cabinet. If the participant is a minor, she will sign the
 312 assent form and program staff will contact the youth's parent for signing of the parental consent
 313 form. No participants will complete an assessment until the consent form (and assent form,
 314 where applicable) has been completed by both the participant (and the participant's guardian,
 315 where applicable) and staff member.

316
 317 After signing consent for the study, mothers will be offered participation in a nested oral health
 318 study that includes: a maternal questionnaire on oral health knowledge, attitudes and behaviors;
 319 collection of infant saliva and plaque samples for microbiologic analysis; an infant oral
 320 examination to identify tooth decay; infant tooth eruption evaluations to identify the presence of

321 baby teeth; and, review of the infant's medical and dental charts to collect oral health risk factors
 322 and examination findings. Program staff will explain the additional assessments associated with
 323 the nested study to participants, including study procedures, risks and benefits associated with
 324 participating in these assessments and the rights and responsibilities of study participants
 325 during the consenting process. Study staff will explain that not taking part in the assessments
 326 associated with this nested study will not impact their participation in the other parts of the
 327 study. If they would like to participate in the oral health nested study, they will sign an additional
 328 section on the consent form to indicate this.

330 The research will take place in the United States in the Northern Navajo Agency (within 50
 331 miles of Shiprock, NM) on the Navajo Nation, located in New Mexico. The consent process
 332 will be completed in English.
 333

Country	Consent Document(s) (adult consent, parental permission, youth assent, etc.)	Languages
United States of America	<ul style="list-style-type: none"> • Adult Consent • Youth Assent • Parental Permission 	English

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 335
 336

C. Study Implementation:

337 1. Describe the procedures that participants will undergo. If complex, insert a table
 338 below to help the reviewer navigate.
 339

Intervention:

341 Intervention activities will consist of the delivery the FSN home-visiting module between 3 to 6
 342 months post-partum. FSN was developed through an iterative process between Johns Hopkins
 343 University and communities in the Navajo Nation. This participatory approach included
 344 leadership from our Community Advisory Board (CAB) for cultural and contextual guidance and
 345 continuous engagement of Navajo stakeholders. The format of the intervention is consistent
 346 with past Family Spirit, a maternal and child health home visiting program developed by the
 347 research team and rigorously tested in a previous study (IRB # H.22.05.06.14.A1). The FSN
 348 curriculum draws on lessons learned from Family Spirit and targets early childhood feeding
 349 behaviors and practices. Trained FHC will teach lessons to mothers and other caregivers the
 350 mother invites to participate using tabletop flipcharts in participants' homes or private locations
 351 of their choosing. Lessons are highly visual and interactive, and will incorporate cultural
 352 teachings related to infant feeding and nutrition that support aims. This study will assess the
 353 impact of 6 of the FSN lessons delivered to mothers at developmentally critical time to establish
 354 optimal infant feeding practices (3-6 months postpartum), including: 1) Delayed introduction of
 355 SSBs: Health Coaches will provide support, education and skills to help mothers reduce or
 356 avoid SSB feeding between 3-6 months of life. Based on American Academy of Pediatric
 357 guidelines, they will teach that breast milk, formula and water are the best beverage choices in
 358 the first year of life³⁹; 2) Complementary Feeding: The AAP recommends introducing
 359 complementary/solid foods around 6 months of age. Health Coaches will provide support,
 360 education and skills to ensure proper timing, methods and choices related to introduction of
 361 solids; and 3) Responsive feeding: Embedded in the emotional context between caregivers and
 362 children that occurs during meals, responsive feeding styles are characterized by positive

363 caregiver guidance and recognition of the child's cues of hunger and satiety²¹. Health Coaches
 364 will provide support, education and skills to help parents learn to recognize their infant's cues of
 365 hunger and satiety and respond in developmentally sensitive, emotionally supportive, and non-
 366 intrusive ways.

367
 368 **Control Program:** Mothers randomized to the control group will receive 3 educational lessons on
 369 home safety and child safety proofing. These meaningful topics were selected so as not to dilute
 370 measurement on key FSN outcomes and to provide benefit to all study participants. Lessons will
 371 be delivered monthly (at 3, 4 and 5 months postpartum) in the same format as the FSN lessons,
 372 by trained FHCs in the home of the participant or in a private place of their choosing.

373
 374 **Water Delivery:** Drinking water will be delivered to the household of each participant (both in the
 375 intervention and control groups) from 6 to 9 months postpartum. The amount of water will be
 376 determined by the number of children and adults living in the household at the time of water
 377 delivery. The first delivery of water will occur at the time of the 6-month evaluation and the last
 378 delivery will occur at the time of the 9-month evaluation. Water will be delivered as often as
 379 weekly. Those families who do not need weekly water delivery (based on their preference and
 380 their usage of the first delivery of water) will receive water less frequently.

381
 382 **Data Collection: (Table 2 and Table 3)**
 383 Data collection will include interviews, self-report assessment, observations and medical chart
 384 reviews. If the participant consents to the nested oral health study, data collection will also
 385 include an additional self-report assessment, collection and testing of infant oral specimens,
 386 infant tooth eruption evaluation, infant oral examination and review of medical and dental charts.

387
 388 **Completed by Health Coach:**
 389 **Session Summary Form:**
 390 Completed by the Family Health Coach at each session, this form will include information about
 391 the visit date, time, participants involved, lesson covered or other activity completed during the
 392 visit, activities completed and necessary referrals. No time burden for participants.

393
 394 **Interviews:**
 395 Trained study staff members will ask participants questions, probe participants and record
 396 participants' answers via REDCap.
 397 **Maternal Demographics:** Assessment developed by the study team, will include information
 398 about maternal age, living situation (including number in household) and socioeconomic status.
 399 The Maternal Demographics assessment will be completed at baseline, 4, 6, 9 and 12 months
 400 postpartum.

401 **Modified Infant Beverage Intake Questionnaire:** Mothers will be asked questions from an
 402 adapted version of the Pre-School-Aged Beverage Intake Questionnaire (BEVQ-15), shown to
 403 be reliable and valid among children ages 3 to 5 years of age⁴⁰. Additional feeding questions
 404 developed by the study team based on previous studies conducted by the co-investigators are
 405 also asked. The 61-item adapted assessment will be used to assess beverage intake among
 406 infants and includes questions about the frequency of infant's beverage intake in the past month
 407 including breastmilk and formula, feeding practices, introduction of complementary feeding, and
 408 introduction of SSBs among infants. The assessment will be completed at baseline, 4, 6, 7, 8, 9
 409 and 12 months postpartum.

410 **Maternal Beverage Intake Questionnaire:** Mothers will be asked questions from an adapted
 411 version of the Beverage Intake Questionnaire (BEVQ-15) a 15-item assessments including
 412 questions about their beverage intake in the past month. The assessment has been shown to
 413 be reliable at assessing beverage intake among adults⁴¹. We have adapted the assessment to

414 ensure cultural and contextual match with participants. The assessment will be utilized to
415 assess beverage intake among mothers and will be completed at baseline, 4, 6, 7, 8, 9 and 12
416 months postpartum.

417

418 **Self-Report:**

419 All participants will complete a self-report via REDCap assessment. The self-report includes the
420 following questionnaires:

421 **Household water security:** Participants will complete the 20-item household water security
422 and accessibility assessment at baseline, 4, 6, 7, 8, 9 and 12 months postpartum. The
423 assessment was developed in partnership with Navajo stakeholders and includes questions
424 utilized in previous studies and from the World Bank's Living Standards Measurement Study⁴³.
425 It will be utilized to identify household water security status of enrolled mothers.

426 **Infant and Toddler Responsive Feeding Scales:** Completed by the mother at baseline, 4, 6, 9
427 and 12 months postpartum, this 24-item questionnaire asks mothers to indicate how often they
428 engage in specific feeding behaviors to assess maternal feeding styles. The assessment has
429 been used and validated in culturally diverse settings⁴⁴

430 **Maternal Nutrition and Feeding Practices Knowledge:** A 14-item assessment created by the
431 study team to assess maternal knowledge through a series of curriculum based knowledge
432 questions. Mothers will complete the assessment at baseline, 4, 6, 9 and 12 months
433 postpartum.

434 **Perception of Eating:** Adapted from the perceptions of eating questionnaire utilized with WIC
435 mothers, the 4-item assessment will be completed by the mother at baseline, 4, 6, 9 and 12
436 months postpartum and assesses mother's perception of their infant's weight.⁴²

437 **Perceived Stress Scale:** Completed by mothers, the 4-item questionnaire will assess maternal
438 stress. The assessment will be completed by mothers at baseline, 4, 6, 9 and 12 months
439 postpartum.⁴²

440 **CES-D:** Utilized to assess depression among mothers, the 20 item questionnaire has been
441 utilized to assess depression with Navajo mothers. The questionnaire asks participants to rate
442 how often over the past week they experienced symptoms associated with depression, such as
443 restless sleep, poor appetite, and feeling lonely. Response options range from 0 to 3 for each
444 item (0 = Rarely or None of the Time, 1 = Some or Little of the Time, 2 = Moderately or Much of
445 the time, 3 = Most or Almost All the Time). Scores range from 0 to 60, with high scores
446 indicating greater depressive symptoms. A CES-D score of 16 or greater indicate individuals at
447 risk for clinical depression. The assessment is both valid and reliable and will be completed by
448 mothers at baseline 4, 6, 9 and 12 postpartum.

449 **Infant Temperament:** The 6-item questionnaire will be completed by mothers at baseline, 4, 6,
450 9 and 12 postpartum to assess their perception of infant's temperament. The assessment has
451 been utilized with WIC mothers.⁴²

452 **Safety Questionnaire:** A 13-item questionnaire developed by the study team will assess
453 maternal knowledge, attitudes and behaviors associated with household safety. Mothers will
454 complete the assessment at baseline, 4, 6, 9 and 12 months postpartum. Results from this
455 assessment will be utilized to inform community members and stakeholders of the benefit of the
456 study on those who are randomized to the control condition.

457 **Brief Infant-Toddler Social and Emotional Assessment (BITSEA):** The 42-item assessment
458 a screener for social-emotional/behavioral problems and delays in competence. The
459 assessment will be completed at 12 months.⁴⁵

460 **Satisfaction Questionnaire:** The satisfaction questionnaire will assess participant's program
461 satisfaction. Developed by the research team, the assessment will be completed at 12 months.

462

463 **Observations**

464 **Home Safety Observation:** A 27 item household safety developed by the study team will
 465 capture key aspects of child safety in the home. The home safety checklist will be completed by
 466 study staff at baseline and 12 months postpartum. Results from this assessment will be
 467 discussed with study participants and strategies for improving home safety will be discussed
 468 with participants.

469 **Medical Chart Reviews**

470
 471
 472 **Growth and Birth Statistics -Infant-** Medical chart reviews will be conducted by Family Health
 473 Coaches at 12 months postpartum. The medical chart review will collect information about the
 474 child's gestational age, gender, birth weight and length as well as the child's weight and length
 475 over their first year of life. The reviews will be conducted by trained study staff.

476
 477 **Medical Chart Review – Mother-** Medical chart reviews will be conducted by Family Health
 478 Coaches at 12 months postpartum. The medical chart review will collect information about the
 479 number of children the mother has had, diabetes status before and during birth as well as
 480 weight and height before pregnancy, during pregnancy and during the first year of their child's
 481 life.

482 **NESTED ORAL HEALTH STUDY ASSESSMENTS**

483
 484 Only participants who consent to the nested oral health study will participate in the following
 485 assessments.

486 **Self Report:**

487
 488 **Oral Health Questionnaire:** A 40-item questionnaire developed and validated by the Oral
 489 Health Disparities Research Centers study team will assess maternal knowledge, attitudes and
 490 behaviors associated with their child's oral health. Mothers will complete the assessment at
 491 baseline, 6, 9 and 12 months postpartum.

492 **Chart Review:**

493
 494 **Medical Chart Review-Infant:** Medical chart reviews will be conducted for the nested oral
 495 health study by trained study clinicians at 12 and 24 months postpartum to document oral health
 496 risk factors and findings from the pediatrician's oral exam.

497
 498 **Dental Chart Review- Infant:** Dental chart reviews will be conducted by research study
 499 clinicians at 12 and 24 months postpartum to document utilization of dental services and
 500 completion of dental procedures (e.g. fluoride varnish application).

501 **Infant Specimen Collection, Tooth Eruption Evaluation and Oral Examination:**

502
 503 **Infant Saliva and Plaque Collection:** Specimens will be collected from infants at baseline, 6, 9
 504 and 12 months post-partum and subjected to laboratory-based microbiologic analysis.

505 **Infant Tooth Eruption Evaluation:** The infant tooth eruption evaluations will be completed at
 506 baseline, 6, 9 and 12 months post-partum to document the presence and eruption pattern of
 507 teeth.

508 **Infant Oral Examination:** Trained research study dental personnel hired by Johns Hopkins
 509 (e.g., dentist or hygienist) will conduct an oral examination of the infant's mouth at 12 months
 510 postpartum by to identify tooth decay. If any treatment needs are identified, the infant will be
 511 referred to dental care.

512
 513 **Table 2** summarizes selected measures, their timetable, and respondent time burden for the
 514 study.

Instrument	Time Burden	Base line	4 mos	6 mos	7 mos	8 mos	9 mos	12 mos	24 mos	All Visits
Completed by FHC										
Session Summary Form	-----									X
Self-Report Assessments										
Completed as Interviews										
Maternal/Family/Household Demographics	15 min	X	X	X			X	X		
Maternal and Modified Infant BEVQ-15	20 min	X	X	X	X	X	X	X		
Completed by Mothers										
Household Water Insecurity Assessment	5 min	X	X	X	X	X	X	X		
Maternal Nutrition/Feeding Practices Knowledge Test	5 min	X	X	X			X	X		
Infant Responsive Feeding Scales	10 min	X	X	X			X	X		
Perceptions of Eating Scale	5 min	X	X	X			X	X		
PSS	5 min	X	X	X			X	X		
CES-D	5 min	X	X	X			X	X		
Infant Temperament	5 min	X	X	X			X	X		
Brief Infant-Toddler Social and Emotional Assessment	5 min							X		
Safety Questionnaire	5 min	X	X	X			X	X		
Satisfaction Questionnaire	5 min							X		
Observation completed by Family Health Coach										
Home Safety Observation	15 min	X						X		
Infant Medical Chart Review										
BMI Z-Scores	-----							X		
Maternal Medical Chart Review										
Parity, Pregnancy weight gain, BMI	-----							X		
Total Participant Time Burden (min)		105	90	90	25	25	90	105	0	

515

516 **Table 3** summarizes selected measures, their timetable, and respondent time burden for the
 517 nested oral health study activities.

Nested Oral Health Study Assessments										
Instrument	Time Burden	Baseli ne	4 mos	6 mos	7 mos	8 mos	9 mos	12 mos	24 mos	
Completed by Mothers										
Maternal Oral Health Questionnaire	10 min	X		X			X	X		
Infant Medical Chart Review										
Oral health risk factors and exam findings	-----							X	X	
Infant Dental Chart Review										
Oral exam procedures and findings	-----							X	X	
Specimen Collection, Tooth Eruption Evaluation and Oral Examination										
Infant Saliva Collection	2 min	X		X			X	X		
Infant Plaque Collection (when teeth present)	1 min	X		X			X	X		
Infant Tooth Eruption Evaluation	2 min	X		X			X	X		
Infant Oral Examination	10 min							X		
Additional Participant Time Burden (min)		15		15			15	25	0	

518

519 The baseline assessment will be completed before 14 weeks postpartum by all mothers who
 520 have consented into the study. For mothers who are enrolled when their baby is less than 10
 521 weeks old, the baseline assessment will take place in two sittings. The first sitting will occur after
 522 consent is obtained. The maternal demographics and water availability assessments will be
 523 administered at this time. The second sitting will occur between 10 and 14 weeks postpartum.

524 The remainder of the baseline assessment will be administered at this time. For mothers who
525 are enrolled when their baby is between 10 and 14 weeks old, the entire baseline assessment
526 will be completed in one sitting. To schedule this and other assessments, study staff will contact
527 participants first by phone and, if unavailable, through a home visit, to arrange a
528 confidential/private location of their choice for follow-up assessment administration.
529

530 Data will be collected and managed using REDCap. A user name and password are required to
531 access the REDCap system. Study staff will launch the assessments on a computer or tablet.
532 Tablets will be synced on a daily basis with REDCap using a secure Wi-Fi connection available
533 at the study site. For the assessments completed via interview, staff will read the question to the
534 participant. Study staff are trained to provide additional information to clarify questions as
535 necessary. After completion of the interview, the study staff member will provide the computer
536 to the participant so that they can complete the remaining assessment via self-report. They will
537 be available if questions should arise. Data collected through REDCap is automatically stored
538 on a Johns Hopkins server secure, HIPAA compliant server. Direct data entry into REDCap
539 eliminates the need for separate data entry and coding. Any data that is collected via hard copy
540 will be entered into REDCap. Data will be downloaded from REDCap as a complete database
541 into de-identified Excel and Stata files that will be stored on JHU's HIPAA compliant, secure
542 server. The data will be retained until the end of the study.
543

544 During informed consent, participants will also be asked to sign IHS 810 forms which allow
545 study staff to access their child's medical and dental records at the Northern Navajo Medical
546 Center IHS Hospital. Separate IHS 810 forms will be signed by the mother for each of the
547 following medical chart data reviews: 1) infant growth and birth statistics for the period from the
548 date of study enrollment to one year post enrollment, 2) infant oral health information from the
549 medical charts for the period from the date of study enrollment to two years post enrollment, 3)
550 infant dental/oral health information from dental charts for the period from the date of study
551 enrollment to two years post enrollment. Study staff will use separate a medical chart review
552 form to extract information from the participant's child's medical record regarding each of these
553 topics.
554

555 Mothers will also be asked to sign an IHS-810 form which allows study staff to access their
556 medical record at the Northern Navajo Medical Center IHS Hospital. Study staff will use the
557 medical chart review form to extract information from the participant's medical record regarding:
558 1) parity, 2) diabetes status before and during pregnancy, 3) weight before, during and after
559 pregnancy.
560

561 The purpose of the infant medical chart and dental chart review is to: 1) determine if the FSN
562 intervention vs. the control condition impacted child z-BMI (for age and gender); 2) obtain
563 information about the oral health risk factors and the findings of the pediatrician's oral exam.
564

565 The purpose of the maternal medical chart review is to: 1) determine if the FSN intervention vs.
566 the control condition impacted maternal BMI; and 2) to explore the relationship between
567 maternal diabetes status, maternal weight and child outcomes.
568

569 If the participant declines any of the IHS-810 forms, they will still be able to participate in the
570 study.
571

572 *2. Describe the number and type of study visits and/or contacts between the study*
573 *team and the participant, how long they will last, and where/how they will take*
574 *place.*

575
 576 Participants' study involvement will occur over a period of 9 months. The intervention and
 577 control condition will be delivered in the home of participants or in a private place of their
 578 choosing when participants are 3 to 6 months postpartum. Water will be delivered to the home
 579 of the participants from 6 to 9 months postpartum. The final assessments will occur at 12
 580 months postpartum.

581
 582 Evaluations will be conducted 7 times at: baseline (<14 weeks postpartum), 4, 6, 7, 8, 9, and
 583 12-months postpartum. Each interview, self-report assessment and observation administration
 584 will last approximately 25 to 105 minutes. The nested oral health study will last approximately
 585 15 to 25 minutes.

586
 587 *3. Describe the expected duration of the study from the perspective of the individual*
 588 *participant and duration overall.*
 589

590 This intervention will be conducted over a 6-month period; participants in the intervention group
 591 will receive 6- 45 minute lessons in their home or a private place of their choosing and
 592 participants in the control group will receive 3- 30 minute safety lessons in their home or a
 593 private place of their choosing. The baseline assessment will be completed by the participant
 594 before 14 weeks postpartum, and evaluations will be completed by the participant at 4, 6, 7, 8, 9
 595 and 12 months postpartum. Participants will have the option to also participate in oral health
 596 components at baseline, 6, 9 and 12 months postpartum. Estimated total participation for
 597 participants randomized to the FSN intervention, including the full FSN intervention and all
 598 evaluation participation, is a maximum of 14 hours and 30 minutes over 10 months. Estimated
 599 total participation for participants randomized to the control condition, including the control
 600 intervention and all evaluation participation, is a maximum of 11 hours and 30 minutes over 10
 601 months.

602
 603 *3. Provide a brief data analysis plan and a description of variables to be derived.*

604 To assess whether between group comparability was achieved through randomization,
 605 demographic and outcome variable distributions at baseline will be compared by group
 606 (intervention vs. control), using t-tests or chi-square tests as appropriate. For time discrete
 607 outcome measures, t-tests or chi-square tests will be used to assess intervention impact on
 608 each outcome in unadjusted analyses. Multivariate linear or logistic regression will be used to
 609 test the impact of the intervention on each outcome, controlling for baseline demographic
 610 characteristics where necessary. For time varying outcomes we will examine the impact of the
 611 intervention by analyzing between group differences at each time point using t-tests and
 612 multivariate regression analyses. For those outcomes with sufficient power, multi-level mixed-
 613 effects models with a random effect at the individual level and appropriate variance structures,
 614 and an interaction term for treatmentXchild age will be used to examine change over the
 615 intervention period.^{46, 47} We will also explore whether water insecurity moderates the impact of
 616 the intervention on these outcomes in the multivariate models between 3 and 6 months
 617 postpartum. Between 6 and 12 months postpartum, we will explore the impact of the provision
 618 of drinking water on SSB intake in both groups. To measure the impact of the control group
 619 curriculum, between group differences in home safety knowledge and behavior will be
 620 measured at each time point. Missing data will be handled as follows: 1) document reason(s) for
 621 missing data to inform model development; 2) assess treatment dropouts to do intent-to-treat
 622 analysis; and 3) conduct sensitivity analysis to compare inferences that are based on different
 623 plausible reasons for missingness⁴⁸. Navajo and Hopkins investigators will collaborate with

624 community partners in data interpretation to assure accuracy, cultural acceptance and
625 relevance.

626
627 Selected saliva and plaque specimens collected at each time point will undergo next-generation
628 sequencing of the 16S rRNA gene. The resulting sequences will be clustered according to
629 operational taxonomic units (OTU) using a 97% identify cutoff and assigned taxonomy by
630 comparison with fully sequenced bacterial genomes. The relative abundance of bacterial taxa
631 will be compared according to randomization group at each time point using the Kruskal-Wallis
632 test. Kendall's Tau rank coefficient will be used to test for the association between risk factors
633 for tooth decay (e.g., SSB intake) and the relative abundances of selected taxa.

634
635 *4. Describe whether you are collecting or storing personal identifiers, and if yes, why*
636 *you need them, and when and how you plan to dispose of them. Signatures on*
637 *consent forms are considered to be identifiers.*

638 The only personal identifiers that will be collected are:

- 639 - participant's name and signature on the study's consent forms and IHS-810 forms
- 640 - participant's name, date of birth, and contact information on a referral form and an Initial
641 Contact Form
- 642 - recording of participant's name and contact information on Master Roster
- 643 - participant's date of birth on the baseline data collection form
- 644 - infant's medical and dental record number

645
646 A unique ID code will be used to administer and track all data collection forms. All consent forms
647 will be stored until the end of the study, after which they will be destroyed. The Master Roster will
648 be destroyed at the end of the study. Initial Contact Forms will be destroyed at the end of the
649 study.

650
651 A Master Roster list will be generated linking participant IDs to study participants' names and
652 primary contact number. The Master Roster will be used only by study staff to manage study
653 logistics and allow for tracking of individual participants as they take part in intervention and
654 evaluation activities. The Master Roster is essential for organization given the nature of the
655 intervention design and staggered design of the home visits. Study staff will only use participant ID
656 numbers on study documents to protect participant confidentiality. This Master Roster will allow
657 study staff members to make the link between individual and ID number. For example, the Master
658 Roster will be used for tracking when participants should receive each of the lessons and
659 evaluations and will help study staff to find participants. The Master Roster will be electronic and
660 password protected. Only specified study staff will have access to the Master Roster.

661
662 We will collect the names of study participants and their participant ID on consent forms. All
663 consent forms will be kept in a locked cabinet at the local study site. Study data collection forms will
664 only have participant IDs, never participant names, given the sensitive nature of the questions
665 asked. Date of birth will be collected in addition to participant ID only on the baseline assessment in
666 order to calculate the participant's age.

667
668 A unique specimen collection ID will be generated for all specimens collected and can only be
669 linked back to the participant by using participant ID.

670
671
672 *5. Answer the following if they are relevant to your study design:*

673 *i. If the study has different arms, explain the process for assigning*
 674 *participants (intervention/control, case/control), including the sequence*
 675 *and timing of the assignment.*

676
 677 At the time of enrollment, after a participant has been assigned a participant ID and completed
 678 the baseline assessment, their participant ID will be used to randomize individuals to one of two
 679 study groups: FSN intervention or control condition.

680
 681 Randomization will be assigned upon completion of the baseline assessment. Two
 682 randomization lists will be created prior to study initiation using STATA 14 statistical software.
 683 One list will be used for water secure families and the other for water insecure families to ensure
 684 equal distribution across intervention and control groups. After scoring the baseline
 685 assessment, a study staff member will assign randomization based on the participant's water
 686 security status. The local study coordinator will maintain the list as new participants are
 687 randomized.

688
 689 We will use a 1:1 allocation ratio, which is the most statistically efficient model. We will utilize
 690 stratified randomization techniques to ensure a 1:1 allocation of study conditions across
 691 household water security status (water secure vs. water insecure). STATA 14 will be used to
 692 create the randomized allocation scheme. Participants will be blinded to their randomization
 693 status.

694
 695 *ii. If human biospecimens (blood, urine, saliva, etc.) will be collected, provide*
 696 *details about collection, volume (ml) or number, use, storage,*
 697 *identification, and disposal. Include, if relevant, information about*
 698 *genetic or genomic analyses planned for the biospecimens. Provide JH*
 699 *Biosafety Registration Number for clinical and laboratory based*
 700 *research.*

701
 702 Saliva and plaque specimens will be collected at 3, 6, 9 and 12 months from each infant for a
 703 maximum of 8 specimens collected per infant. About 5ml of saliva will be collected from infants
 704 by placing a swab on the floor of the mouth. Plaque will be collected using a cytology brush
 705 (CytoSoft). Both specimen types will be inoculated into specimen transport media and stored
 706 according to the manufacturer's recommendations until further processing. Specimens will be
 707 labeled with a pre-printed barcode and shipped to a collaborating lab overseen by Dr. Nini Tran,
 708 DDS, PhD, a pediatric dentist, microbiologist and Assistant Professor at the University of
 709 California, Las Angeles (UCLA) School of Dentistry to undergo specimen processing and testing
 710 that will include biochemical analysis of the saliva and microbiologic and molecular
 711 characterization of the organisms present in both plaque and saliva. Any specimens not
 712 depleted during specimen testing will be returned to JHU/Baltimore and stored at -80°C. The
 713 specimens will be destroyed upon completion of the study. The specimens will not be used in
 714 future research.

715
 716 *iii. If genetic/genomic analyses are planned, address whether the data will be*
 717 *contributed to a GWAS or other large dataset. Address returning*
 718 *unanticipated incidental genetic findings to study participants.*

719 No human genetic testing will be performed. The only genomic analyses that will be performed
 720 will be on bacteria identified in the saliva and plaque specimens.

721

722 *iv. If clinical or laboratory work will be performed at JHU/JHH, provide the JH*
 723 *Biosafety Registration Number.*

724
 725 There is no clinical or laboratory work at JHU/JHH planned at this time.

726
 727 *v. If you will perform investigational or standard diagnostic laboratory tests*
 728 *using human samples or data, clarify whether the tests are validated*
 729 *and/or the lab is certified (for example is CLIA certified in the U.S.).*
 730 *Explain the failure rate and under what circumstances you will repeat a*
 731 *test. For all human testing (biomedical, psychological, educational, etc.),*
 732 *clarify your plans for reporting test results to participants and/or to their*
 733 *families or clinicians. Address returning unanticipated incidental findings*
 734 *to study participants.*

735
 736 The laboratory testing will be performed in collaboration with Dr. Nini Tran the UCLA School of
 737 Dentistry. We anticipate retesting 5% of specimens by 16S rRNA for identification of bacterial
 738 taxa. No human biological testing will be performed.

740 **6. Data Custody, Security, and Confidentiality Protections**

741
 742

743 **VI. Data Security and Confidentiality Protections:**

744 **A. Personally Identifiable Information (PII):**

745 Please identify the Personally Identifiable Information (PII) that you may be
 746 collecting and using at any of the following stages of your study: **Recruitment,**
 747 **Consent, and Study Implementation.**

Name, signature, initials, or other identifiable code	<input checked="" type="checkbox"/>
Geographic identifier: address, GPS location, etc.	<input type="checkbox"/>
Dates: birth, death, clinical service, discharge, etc.	<input checked="" type="checkbox"/>
Contact information: phone numbers, email address, etc.	<input checked="" type="checkbox"/>
ID: Social Security Number, driver's license number, etc.	<input type="checkbox"/>
Health record identifiers: medical record, insurance plan number, etc.	<input checked="" type="checkbox"/>
Account numbers	<input type="checkbox"/>
Device identifiers: e.g., implants	<input type="checkbox"/>
Internet identifiers: IP address, social media accounts	<input type="checkbox"/>
Biometric identifiers, including finger and voice prints	<input type="checkbox"/>
Audio recordings	<input type="checkbox"/>
Video or full face photographic images	<input type="checkbox"/>
Genomic/genetic data	<input type="checkbox"/>
Any other unique identifying number, characteristic, or code (note: this does not mean the unique code assigned by the investigator to code the data)	<input type="checkbox"/>

Other: Click here to enter text.	<input type="checkbox"/>
--	--------------------------

748
749**B. Recruitment:**

750 Will you collect identifiers for the purpose of contacting potential participants?

751 Yes No 752 If **yes**, will you retain the identifiers after the recruitment contact has been
753 made? Yes No 754 **C. Data Collection:**755 In what form will you collect and store PII? When you respond, think of PII
756 collected for recruitment, consent, and other study purposes.757 1. **Hard Copy/Paper:** Yes No 758
759

If yes, please answer the following:

760 a. How will the data be kept secure during transfer from study collection site to
761 storage site?762 Copies will be kept in investigator's possession during transport. Recruitment and
763 consent forms will not be taken back to the study office by study staff immediately after
764 consent and/or recruitment is completed and will be stored in a locked cabinet. They will
765 not be taken into the field in any circumstance. Data collection forms will all be
766 completed via REDCap on password protected tablets/computers. The computers and
767 tablets will be in possession of the study staff member.768
769b. Will the data be secured in a locked cabinet or room? Yes No 770 c. Are the data collection forms and study data stored without personal identifiers
771 and separate from the study IDs/code? Yes No 772 d. How long after study completion will you keep the hard copy/paper forms? We
773 will keep them up to 3 years after completion of the study774 2. **Electronic:** Yes No 775
776

If yes, please answer the following:

777 a. Will the data be collected/stored on a portable device (laptop, mobile phone,
778 tablet, PDA) protected by encryption? Yes No 779
780

b. Will the data be stored on a secure server or in the Cloud/Web?

781 Secure Server Cloud/ Web 782 c. Will it be encrypted? Yes No 783 d. Will you be backing up your data? Yes No

784 3. **Audio Recording:** Yes No

785

786 If yes, please answer the following:

787 a. Will you store the audio recording securely in a locked cabinet/room until
788 transcription is complete?

789 Yes No

790 b. Will the audio recording be destroyed after transcription? Yes No

791

792 If no, why not?

793

794 4. **Photograph/Video:** Yes No

795

796 If yes, please answer the following:

797 a. Will the photographs/videos be stored securely in a locked cabinet or room?

798 Yes No

799

800 b. Will the photograph/video be destroyed? Yes No

801 If yes, when?

802 **D. PII De-Identification of Data Used for this Study:**

803 When will you destroy the PII and/or the code linking the PII with the study ID?

804 All consent forms will be stored until the completion of the study, after which they will be
805 destroyed. The Master Roster, which will link the PII with the study ID and the initial contact
806 forms, will be destroyed at the end of the study

807 **E. Data Storage and Analysis:**

808 One of the keys to protecting PII is the proper use of tools to share and conduct your
809 analysis. JH and JHSPH offers several options for you to consider. Please select the
810 system that you plan to use to protect your study data by clicking the box. Consult
811 JHSPH IT for assistance if needed.

812

813 **JH Virtual Desktop:** IT@JH provides (for a monthly fee) a virtual Windows
814 desktop.

815 **JHSPH SharePoint and File Shares:** These systems provide a managed
816 and secure platform for your research project. They also provide a built-in
817 encrypted backup solution.

818 **JHSPH RedCAP or HPCC:** These are departmentally managed
819 applications.

820 **JHBox:** Johns Hopkins Box (JHBox) is a secure cloud-based file sharing
821 and file storage service.

822 **Independent Departmental Servers and Systems:** These servers are
823 typically managed by departmental or research team IT staff.

824 **Other:** Please provide details regarding any other systems being utilized.

825

826

827 **F. Other Data Security Measures:**

828 In addition to the details regarding data collection, please review the following questions.

829 This additional information will be utilized to assist in the development of a
830 comprehensive Data Security plan. This would include the systems used to analyze the
831 data, data security contacts and additional requirements.

832

833 1. Do you have a designated person on your research team other than the PI who is
834 the technical contact for a Data Security plan? Yes No

835 If yes, please provide a contact name:

836

837 2. Does your sponsor have other specific data security requirements for the study data?

838 Yes No

839 If possible, please explain:

840

841 Please add any other information that you believe is relevant to data security. Hard
842 copies of data collection materials include only one identifier (participant's date of birth) and an
843 ID code. Data collection materials will be locked in a secure cabinet or room with limited access
844 by specified individuals. Copies will be kept in investigator's possession during transport. A
845 unique code linking the data to subjects' personal information will be stored separately on a
846 secure computer and JHBox, and will only be accessible by authorized study staff..

847

848 Electronic data collected using REDCap will be stored on a secure Johns Hopkins server that is
849 accessible by logging into the REDCap system using a unique, individual-specific username
850 and password. Only the personal identifier of participants' date of birth is included in the
851 database. The data are stored on a computer that is password protected with a secure server.
852 Any electronic documents that links IDs to identifying information (i.e., names/signatures on
853 consent forms and logs) are stored on a computer in accordance with JHSPH Data Security
854 guidance. Transfer or storage on portable devices (e.g., laptops, flashdrives) will be encrypted.
855 The devices on which this information is stored will be accessible only to individuals who need
856 access to these data (i.e., study personnel).

857

858 a. *Who controls access to the data?*

859

860 Only specified research study staff have access to the data. The on-site study coordinator, the
861 field manager and the PI are responsible for ensuring only specified study staff have access to
862 the data.

863

864 b. *Will data be shared only if de-identified?*

865

866 Yes.

867

868

c. *What additional security controls will be in place?*

869

870 All study staff who are also JHU employees, will be trained to the highest standards of
871 confidentiality expected by JHU. All study staff including the PI, Co-Is Study Managers, local
872 study coordinator and study staff will be extensively and repeatedly trained in confidentiality
873 procedures, including:

- 874 • Human subjects protection
- 875 • HIPAA training including risks for legal and civil penalties for breaches of
876 confidentiality
- 877 • Informed consent/assent
- 878 • Professional conduct
- 879 • Research ethics

880

881 All study personnel will be told that confidentiality breaches will be grounds for termination.

882

883 Johns Hopkins faculty at the Center for American Indian Health have a 30-year history
884 employing and training individuals from the Navajo community within the study site to carry out
885 research that requires strict maintenance of participant and tribal confidentiality.

886

887 *D. Describe any plans for destroying data including if, when and how that will be done.*

888

889 All hard copies and electronic versions of data files will be until completion of the study, after
890 which they will be destroyed through paper shredding and removal of all electronic copies from
891 all computers and data bases and servers.

892

893

894 *b. Data Storage*

895

Note: Identifiers include name, address, SSN, hospital record number, etc., and other indirect identifiers (e.g., date of birth) that, when combined with other variables, may make a subject identifiable. These categories reflect minimal standards; you may impose more stringent protections. See the JHSPH Data Security Guidance at www.jhsph.edu/irb > Policies & Guidance > Guidance for additional information regarding best practices.

896

897

Hard Copy of data collection form: Indicate your choice by typing an X in the appropriate box on the left:	
	This activity will not involve receiving and/or accessing hard copies of data.
	Data collection forms RECORD NO PERSONAL IDENTIFIERS connecting study participants, and there are no codes providing a link. Data are anonymous.
X	Data collection forms INCLUDE IDENTIFIERS. The forms are locked in a secure cabinet or room with limited access by authorized individuals. Forms will be kept in study team's possession during transport and will not be left unattended in a vehicle. When possible, de-identified copies will be used for coding and analysis.

	Data collection forms ARE CODED with study participants' random study ID numbers. Codes/links between study IDs and identifiers are stored securely in a separate place (locked storage cabinet or secure electronic database.)
X	Other (describe): Hard copies of Master Roster include three identifiers (participant's name, date of birth, and contact phone number) and an ID code. The Master Roster will be kept in a secure cabinet or room with limited access by specified individuals. Hard copies of data collection materials include only one identifier (participant's date of birth) and an ID code. Data collection materials will be locked in a secure cabinet or room with limited access by specified individuals. When possible, redacted (de-identified) versions of the data collection sheets will be used for coding and analysis. ALL HARD COPIES WILL BE KEPT IN INVESTIGATOR'S POSSESSION DURING TRANSPORT.
Electronic Databases: Indicate your choice by typing an X in the appropriate box on the left: :	
	The data do not contain personally identifiable information
X	These data are stored on a secure server protected by limited access and strong password systems. Data are coded when possible. Portable electronic devices will not contain identifiable information unless encrypted.
	Other (describe):
3. Other Identifiable Data Storage, Retention, and Destruction (Audiotapes, videotapes, photographs, etc.) will be retained and stored securely (locked in cabinet or room) until:	
	Transcription is complete, then will be destroyed.
	Analysis is complete, then will be destroyed.
	Study is complete and file is closed.
	Indefinitely. Provide justification for indefinite retention:
4. Existing Biospecimens to be used in this study:	
	HAVE NO PERSONAL IDENTIFIERS.
	INCLUDE IDENTIFIERS AND ARE CODED; the PI will not have access to the link or code connecting the identifiers to the specimens.
X	INCLUDE IDENTIFIERS, and the PI has access to those identifiers or to the link/code connecting specimens to individuals. The identifiers and/or code will be stored securely until the study is complete.

898
899
900
901
902
903
904
905
906

- G.** Will you use clinical data of 500 records or more from Johns Hopkins Hospital and its affiliates?
Yes No

If yes, please complete the JHM Data Security Checklist available on the JHSPH IRB website: www.jhsph.edu/irb and upload a copy of the checklist to the "Miscellaneous" section.

907 . Will the study data be protected by a Certificate of Confidentiality? If yes, explain who
908 will apply and maintain the Certificate.
909 Yes, the study team will apply for a Certificate of Confidentiality. The Certificate of
910 Confidentiality will be obtained by the PI, Allison Barlow. The Certificate of Confidentiality

911 obliges the researcher to protect the privacy of participants and not reveal anyone's private
 912 information collected through the study. The highest standards of confidentiality protection
 913 procedures will be followed.

914
 915 **H.** Will you use clinical data of 500 records or more from Johns Hopkins Hospital and its
 916 affiliates?

917 Yes No

918
 919 If yes, please complete the JHM Data Security Checklist available on the JHSPH
 920 IRB website: www.jhsph.edu/irb and upload a copy of the checklist to the
 921 "Miscellaneous" section.

922
 923
 924
 925

926 **7. Risks:**

927
 928 *A. Describe the risks, discomforts, and inconveniences associated with*
 929 *the study and its procedures, including physical, psychological,*
 930 *emotional, social, legal, or economic risks, and the risk of a breach of*
 931 *confidentiality. These risks should be described in the consent*
 932 *documents.*

933 All participants will be informed about any potential risks at the time of informed consent. The
 934 primary potential risks associated with study participation are: (a) participant discomfort in
 935 completing the assessments or the intervention sessions (some individuals may be
 936 uncomfortable during sessions because feeding of children and obesity prevention can be
 937 perceived as sensitive topics); and b) someone finding out the individual is in the study or
 938 information the individual shared during the study.

939
 940 There is very little risk to participants of the oral health component who will undergo specimen
 941 collection and brief tooth eruption evaluations. Trained staff will collect specimens and conduct
 942 the tooth eruption evaluations, which will take around 5 minutes combined. Participants will
 943 experience minimal discomfort during each of these.

944
 945 *B. Describe the anticipated frequency and severity of the harms*
 946 *associated with the risks identified above; for example, if you are*
 947 *performing "x" test/assessment, or dispensing "y" drug, how often do*
 948 *you expect an "anticipated" adverse reaction to occur in a study*
 949 *participant, and how severe do you expect that reaction to be?*

950 We do not expect an adverse reaction to any of the assessments, the intervention or specimen
 951 collection.

952
 953 *c. Describe steps to be taken to minimize risks. Include a description of your efforts to*
 954 *arrange for care or referral for participants who may need it*
 955

956 Participation in the study is completely voluntary and participants will have the opportunity to
 957 withdraw at any point. All participants will be informed about any potential risks prior to
 958 enrollment. We will clearly communicate the purpose and expectations of the study at the time
 959 of informed consent and employ AI study staff members from the local community trained in
 960 active listening, maintaining confidentiality, and other relevant procedures to ensure the comfort
 961 and well-being of each participant. All activities associated with the oral health components are
 962 voluntary and will be conducted by trained personnel to mitigate any discomfort and risks
 963 associated with these activities.

964
 965 Following the self-report assessment, Family Health Coaches will receive a summary form
 966 which will indicate if the participant's score on the CES-D indicates they are at risk for clinical
 967 depression (score of 16 or greater). If the score indicates they are at risk for clinical depression,
 968 the health coach will discuss with the participant and provide appropriate referrals, which will
 969 primarily consist of a referral to the Indian Health Services counseling services. Additionally, all
 970 staff will complete the Applied Suicide Intervention Skills Training (ASIST) prior to interacting
 971 with participants. Through this training, health coaches will be able to better identify one's risk
 972 for suicide and have strategies to intervene and help prevent the immediate risk of suicide. If a
 973 health coach believes a participant is at immediate risk for suicide, they will immediately call the
 974 Field Manager or PI as well as local authorities.

975
 976 *d. Describe the research burden for participants, including time, inconvenience, out-of-*
 977 *pocket costs, etc.*

978
 979 The primary burden to participants is the amount of time required to complete the intervention
 980 and evaluations. The full intervention (including up to 6 45-minute FSN sessions) will take up to
 981 270 minutes. Participants also need to be home to receive the water provided as a part of this
 982 study, which could take time. Additionally, participants will need to complete evaluations at 7
 983 time points. Each assessment will take between 25 and 105 minutes to complete plus another
 984 15 to 25 minutes if they consent to participate in the nested oral health study. The total time
 985 required to complete all evaluations including the oral health study assessments is 645 minutes
 986 (10 hours and 45 minutes). We will explain to participants during the informed consent process
 987 and also throughout the study that they are volunteers and are not required to complete any
 988 sessions or assessments. Staff will work with participants to make sure they know they may
 989 always quit the study or skip assessment questions.

990
 991 *e. Describe how participant privacy will be protected during data collection if sensitive*
 992 *questions are included in interviews.*

993
 994 The highest standards of confidentiality protection procedures will be followed. Participants will
 995 complete their assessments in a confidential location; study staff will be available to answer
 996 questions, but will ensure that participants have privacy when filling out the assessments via
 997 hard copy or on the computer. The identity of participants will not be revealed in the
 998 presentation or publication of any results from the project.

1000 **8. Benefits:**

1001
 1002 *A. Describe any potential direct benefits the study offers to participants ("payment" for*
 1003 *participation is not a direct personal benefit).*

1004
 1005 Mothers and infants in this study may benefit from receiving early childhood and parenting
 1006 education from the FSN program. They will receive additional support and learn strategies for

1007 healthy living that may decrease their risk for obesity and tooth decay. They may also benefit
 1008 from the water they receive as a part of the study. The infant oral examination completed by
 1009 trained research dental personnel in the home of the participant at 12 months postpartum could
 1010 identify dental treatment needs, and if so, will result in a referral of the infant to dental care.

1011
 1012 *B. Describe potential societal benefits likely to derive from the research, including value*
 1013 *of knowledge learned.*

1014
 1015
 1016 The community may benefit in the long-term from the study if it results in a decrease in risk
 1017 behaviors and in obesity and tooth decay among the participating infants. If the intervention
 1018 proves effective, the study may provide American Indian communities and other low resource
 1019 communities with a prevention intervention targeting early childhood obesity and tooth decay
 1020 that could impact health over the life course. Additionally, if we find that water insecurity
 1021 impacts sugar sweetened beverage intake among infants the study may provide additional
 1022 leverage to promote programs to increase safe drinking water around the Navajo Nation.

1023 **9. Payment:**

1024
 1025 *A. Describe the form, amount, and schedule of payment to participants.*

1026 Enrolled mothers will be given a \$10 gift card and a gift package (valued at \$15) at the
 1027 completion of the baseline self-report assessment. Thus, the total value of participant
 1028 remuneration, upon completion of the baseline assessment is \$25. Mothers that complete the
 1029 baseline assessment in two sittings will receive the gift package at the first sitting and the \$10
 1030 gift card at the second sitting. After the completion of the 4-month assessment, participants will
 1031 receive a package including toiletries, baby care items and other items needed for the home.
 1032 The value of these items will total \$10. At the completion of the 6, 7, 8 and 9 month
 1033 assessments, participants will receive drinking water for their household. At the completion of
 1034 the 12-month assessment, they will receive a \$10 gift card.

1035
 1036 Participants who consent to the oral health components will receive an additional \$20 at each
 1037 study visit when these activities are conducted (baseline, 6, 9 and 12 months).

1038
 1039 *B. Include the possible total remuneration and any consequences for not completing*
 1040 *all phases of the research.*

1041 Total possible remuneration for participants in the study is \$20 in gift cards, a gift package worth
 1042 \$15, a gift package worth \$10, and drinking water for the family. For participants who consent to
 1043 the oral health components, additional total possible remuneration is \$80 in gift cards. There is
 1044 no penalty for leaving the study early; however, participants will not receive gift cards for
 1045 assessments that are not completed.

1046 1047 **10. Study Management**

1048 a. Oversight Plan

1049
 1050 *1. Describe how the study will be managed.*

1051
 1052 The investigator team located in Baltimore and Albuquerque will train local field-based staff in
 1053 study procedures and monitor study progress. A Field Manager, Nicole Neault, MPH and Field

1054 Coordinator, Reese Cuddy, MPH, who have extensive experience and training in study
 1055 procedures, will directly oversee study progress and ensure fidelity to the study protocol. Ms.
 1056 Neault has directed the field study staff for other related research projects conducted by Navajo
 1057 and JHU for over 10 years, and Ms. Cuddy has experience working with the local site team on
 1058 the implementation of nutrition projects. The Field Coordinator will oversee a Local Coordinator,
 1059 Leonela Nelson who will ensure proper data management and program implementation.
 1060 Weekly study calls between the investigator team, the Albuquerque team and the Shiprock-
 1061 based study team will be conducted to review study progress and address any concerns.

1062
 1063 *2. What are the qualifications of study personnel managing the project?*

1064
 1065 The investigator team located in Baltimore, Dr. Allison Barlow (PhD) (PI), Dr. Summer
 1066 Rosenstock (PhD), Dr. Lindsay Grant (PhD) and Ms. Allison Ingalls, MPH, along with the
 1067 investigator team in Albuquerque, NM, Ms. Nicole Neault, MPH (Field Manager) and Ms. Reese
 1068 Cuddy, MPH (Field Coordinator) will manage the program and be on-call at all times. They will
 1069 train staff extensively in all study procedures. All of the local staff who will be employed for this
 1070 study already have extensive experience working with community members. If staff members
 1071 need any kind of assistance with participants, they will be able to reach Allison Barlow, Nicole
 1072 Neault or Reese Cuddy immediately. Additionally, on-site support will be provided by the Local
 1073 Site Coordinator.

1074
 1075 All personnel involved in the study have extensive experience implementing and/or overseeing
 1076 implementation of qualitative and quantitative research studies in the Navajo community. The
 1077 investigator team is well versed in program management principles and human subject's
 1078 research protection.

1079
 1080 *3. How will personnel involved with the data collection and analysis be trained in*
 1081 *human subject's research protections? (Use the JHSPH Ethics Field Training Guide*
 1082 *on our website.)*

1083
 1084 At the beginning of the study period, the PI and other members of the investigative team will
 1085 provide several in-person training sessions to program staff focusing on study protocol and
 1086 procedures and protection of human subjects and confidentiality. Throughout the duration of the
 1087 study, the Investigator team will have weekly conference calls with program staff to monitor
 1088 study progress and assure that the study is being implemented according to protocol. The PI
 1089 and/or other members of the investigative team located in Baltimore will make 3-4 trips and the
 1090 Albuquerque based management team will make 6-8 trips to the study site during the study's
 1091 duration to assess study progress, fidelity to study protocol, protection of human subjects, and
 1092 assurance of data quality and safety. The PI and both Program Managers will be available
 1093 throughout the study timeline to ensure fidelity to procedures and administration of the post-
 1094 assessments.

1095
 1096 *4. If the PI will not personally be on-site throughout the data collection process, provide*
 1097 *details about PI site visits, the supervision over consent and data collection, and the*
 1098 *communication plan between the PI and study team.*

1099
 1100 Throughout the duration of the study, the PI will have weekly conference calls with study staff to
 1101 monitor study progress and assure that the study is being implemented according to protocol.
 1102 One senior member of the investigator team will conduct regular visits to the study location to
 1103 assess fidelity to study protocol, protection of human subjects, and assurance of data quality

1104 and safety. An on-site coordinator will provide in-person oversight and monitor consent and
 1105 data collection to ensure the study is progressing according to protocol.

1106
 1107 Fidelity monitoring of FSN intervention implementation will be performed on 10% of all FSN
 1108 intervention sessions conducted. Fidelity monitoring will be conducted by the Field Manager,
 1109 Field Coordinator or the on-site coordinator. 10% of all sessions will be randomly selected and
 1110 be observed in person. Study staff performing quality assurance will complete a feedback form
 1111 and review the feedback form with the FSN Health Coach. Additional training will be conducted
 1112 as necessary. A description of the fidelity monitoring process is included in the consent and
 1113 assent documents. Fidelity monitoring data will be stored following the same criteria as
 1114 participant data (see above).

1115
 1116 *b. Recordkeeping:*

1117
 1118 The Local Coordinator will be trained in study procedures and will oversee data collection and
 1119 storage. They will work with the Field Manager and Field Coordinator to ensure fidelity to the
 1120 study protocol. The Field Manager and Field Coordinator will discuss all concerns with the
 1121 investigator team. As noted above, the PI and other members of the investigator team will
 1122 conduct in-depth quality assurance checks during the study period. The PI will be responsible
 1123 for reporting to the IRB.

1124
 1125 *C. Safety Monitoring*

1126 *1. Describe how participant safety will be monitored as the study progresses, by*
 1127 *whom, and how often. Will there be a medical monitor on site? If yes, who will serve*
 1128 *in that role?*

1129
 1130 The Principal Investigator assumes responsibility for the safety of study participants. We do not
 1131 anticipate significant problems with participant safety. Program staff will be trained to monitor
 1132 for safety of study participants and report any concerns immediately to the PI. All study staff will
 1133 be trained in human subject's research and will be required to complete the CITI ethics and
 1134 HIPAA modules prior to any interaction with participants or study data. Certificates of training in
 1135 human subject's research are kept on file at the Center for American Indian Health's office in
 1136 Baltimore. Our Center for American Indian Health has extensive experience administering
 1137 home-based programs in American Indian communities. As described in the consent, the
 1138 program team will be trained to respond appropriately if there are any concerns with the safety
 1139 of a participant.

1140
 1141 *2. If a Data Safety Monitoring Board (DSMB), or equivalent will be established,*
 1142 *describe the following:*

1143 Not Applicable

1144
 1145 *3. Describe plans for interim analysis and stopping rules, if any*

1146
 1147 Please see our Data Analysis plan.

1148
 1149 *a. Reporting unanticipated problems/adverse events (AE's) to the IRB. Describe plan for*
 1150 *reporting to the IRB and (if applicable) to the sponsor. Include plan for government-*
 1151 *mandated reporting of abuse or illegal activity.*

1152

1153 The Field Manager will immediately alert the Principal Investigator in the event of an adverse
 1154 event or unanticipated problem. The Principal Investigator will report serious adverse events to
 1155 the JHSPH IRB. If there is any child abuse reported during study participation, the Field
 1156 Manager will immediately report this information to the PI. The PI will report this to appropriate
 1157 Tribal Authorities; on the Navajo Nation potential abuse must be reported to Tribal Social
 1158 Services. With experience from previous studies with the Navajo Nation community, the study
 1159 team is knowledgeable of how to report this type of event without revealing study participation.
 1160

- 1161 A. Other IRBs/Ethics Review Boards: *If the research will require review by other IRBs,*
 1162 *provide the name and contact information for each IRB/ethics review board and its*
 1163 *Federal Wide Assurance, if it has one (available on OHRP's website at*
 1164 *<http://www.hhs.gov/ohrp/assurances>).*
 1165

1166 This project has been approved by Chapters within the Norther Navajo Agency. After approval
 1167 is received from the JHSPH IRB, the protocol will be sent for review and approval to Navajo
 1168 Nation Human Research Review Board (NNHRRB). (The NNHRRB has requested that
 1169 protocols be sent to their IRB for review, only after approval has been received from the
 1170 academic institution overseeing the research).
 1171

1172 B. Collaborations with non-JHSPH Institutions

1173 *For studies that involve collaboration with non-JHSPH institutions, complete the chart below by*
 1174 *describing the collaboration and the roles and responsibilities of each partner, including the*
 1175 *JHSPH investigator. This information helps us determine what IRB oversight is required for*
 1176 *each party. Complete the chart for all multi-collaborator studies.*

1177 **Insert Name of Institutions in Partner column(s); add additional columns if necessary.**

	JHSPH	UCLA School of Dentistry	Partner 2
Primary Grant Recipient	X		

1178 **For the following, indicate "P" for "Primary", "S" for "Secondary" as appropriate to role and level**
 1179 **of responsibility.) Add additional items if useful.**

1	Human subjects research ethics training for data collectors	P		
2	Day to day management and supervision of data collection	P		
3	Reporting unanticipated problems to the JHSPH IRB/Sponsor	P		
4	Hiring/supervising people obtaining informed consent and/or collecting data	P		
5	Execution of plan for data security/protection of participant data confidentiality, as described in Sect. 5.	P		
6	Biospecimen processing, storage, management, access, and/or making decisions about future use	P		
7	Biospecimen testing and interpretation		P	

1180
1181

1182

1183

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IRB Approved Protocol Amendments Summary

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- 3/1/17 Clarified water delivery procedures.
- 7/19/17 Increased baseline assessment window of completion, and updated recruitment procedures to include access to EHR via HIPAA waiver approval.
- 10/18/17 Corrected time points for the administration of the home safety scan.
- 3/28/18 Increase number of allowable consents to 150.
- 8/1/18 Added information about the UCLA partner lab.