Family-Centered Care and Unmet Healthcare Needs among U.S. Children:

Structural Equation Modeling using the Medical Expenditure Panel Survey

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BACKGROUND

- **Family-centered care (FCC)** is an innovative approach to pediatric healthcare planning, delivery, and evaluation.
  - Intended to engage families as partners in clinical communication and shared decision-making (SDM) to promote quality care and health among children and their families.

- **Family-centered care is important**.
  - Represents a paradigm shift in pediatric healthcare delivery models
  - Is a national healthcare priority
  - *May* be associated with improved health-related outcomes

- Different FCC measures exist, but many have been constructed from similar item sets.
  - Some are the same as measures of shared decision-making (SDM).
    - **33.4%** = 23,189,116 children aged 0-17 years nationwide *DO NOT* receive FCC
    - **31.4%** = 250,537 children aged 0-17 years in OREGON *DO NOT* receive FCC

BACKGROUND

- Unmet healthcare needs affect many children and families.
  - 6.7% = an estimated 4,922,774 children nationwide
  - 8.4% in Oregon = 71,503 children
- Unmet healthcare needs may be associated with the following longer-term outcomes:
  - Increased acute care utilization
  - Higher medical expenditures
  - Poorer child health and functional status
  - Poorer parent health and greater stress
- Little research has shown higher FCC is associated with reduced unmet healthcare needs over time.

Research Aims

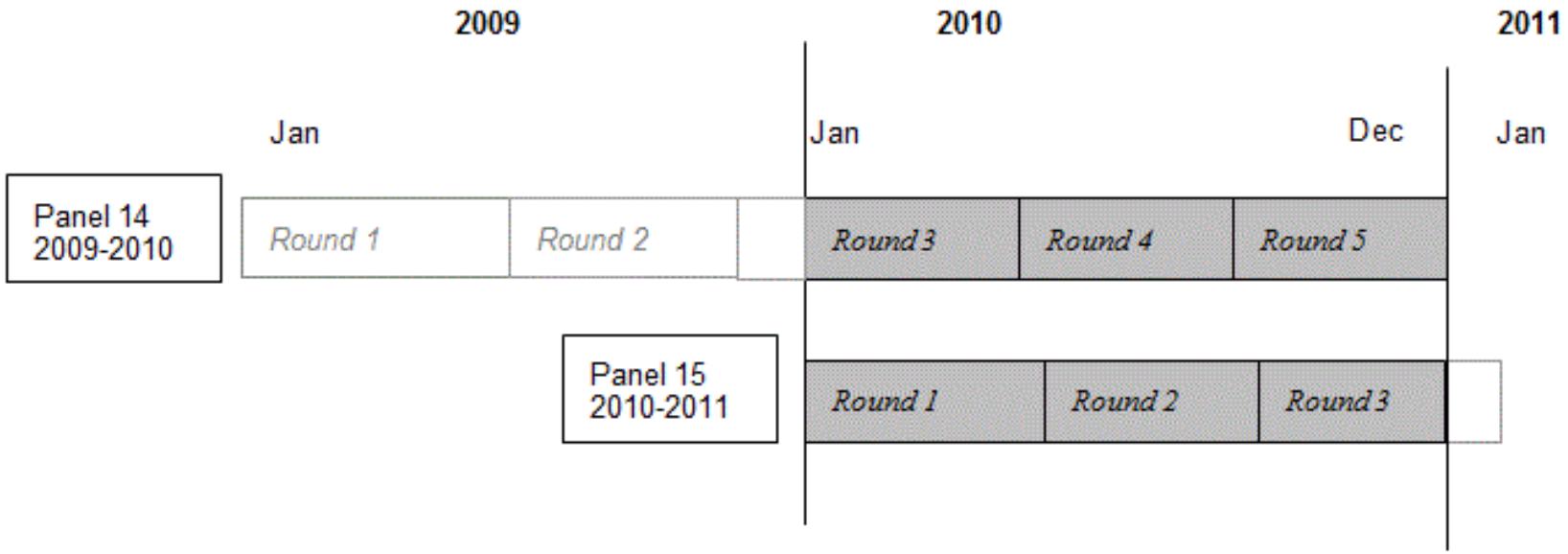
1. Develop a measurement model for family-centered care using commonly used items from the Medical Expenditure Panel Survey Household Component.

2. Examine temporal associations between family-centered care and unmet healthcare needs among U.S. children over the two-year survey period.

SURVEY & DATA

- Medical Expenditure Panel Survey Household Component (MEPS HC)
  - Complex, probability sample of U.S. households
  - One adult reports all data for household members
- Panel 15 longitudinal data file
  - Data collected from 2010 to 2011, roughly 30-months
- Downloaded publicly use file (PUF) from the Agency for Healthcare Research and Quality (AHRQ)

MEPS HC OVERLAPPING PANEL DESIGN



FAMILY-CENTERED CARE ITEMS

- Six ordinal items (all 4-point scales) from the MEPS-HC child preventive health supplement (CS) and access to care (AC) modules
  - Two item sets (same items): one from Round 2 (2010) and one from Round 4 (2011)
- These items have been previously used by child health services researchers to study FCC or SDM receipt.
- Four of these items were adopted from the CAHPS “Doctor who listens well” composite measure (adult version).

UNMET HEALTHCARE NEEDS ITEMS

- Six ordinal items (all 4-point scales) also from the CS and AC modules of the MEPS-HC
  - Two item sets (same items): one from Round 2 (2010) and one from Round 4 (2011)
- These items have also been previously used to assess unmet healthcare needs.
- Many children have missing data on these items due to survey skip patterns, attrition, and coding.

COVARIATES

- **Predisposing characteristics**
  - Age (years)
  - Gender
  - Race/ethnicty
- **Enabling resources**
  - Primary household language
  - Household income (relative to the federal poverty level)
  - Health insurance status
  - Region of residence
- **Need factors**
  - CSHCN status (according to the CSHCN Screener)
  - Number of annual office-based visits

Most at the child level in 2010 (time-fixed) and constructed based on past research.

GENERAL ANALYTIC APPROACH

- All analyses performed in Stata 13.1.

- Analyses weighted per AHRQ guidance due to survey's complex sampling design and to generate population estimates (svy subpop commands).
  - This changes Stata's capabilities to produce certain statistics.

SAMPLE CHARACTERISTICS

- 4,043 U.S. children aged 0-17 years in 2010
  - Represents an estimated 74,546,698 children nationwide.
- Majority of children were:
  - School-aged, 6-17 years (mean age = 8.6 years);
  - White, non-Hispanic (53.6%);
  - Lived in primarily English-speaking households (83.1%); and
  - Had some private health insurance coverage (56.5%).
- 1 in 5 were CSHCN (19.9%); consistent with past estimates.
- Average of three office visits per year.
- Most (89.3%) had a usual source of healthcare (USC).

DESCRIPTIVE & BIVARIATE STATISTICS FOR COMPOSITE MEASURES

- Statistically significant, unadjusted associations (unstandardized results)

		Year 2 (2011)	
		Unmet Healthcare Needs Mean	FCC Mean
		(*n* = 3648)	(*n* = 3639)
Year 1 (2010)	*M* (*SD*)	1.57 (0.68)	3.62 (0.56)
FCC Mean (*n* = 3632)	3.64 (0.55)	-0.27*** (-0.34, -0.20)	0.35*** (0.29, 0.41)
Unmet Healthcare Needs Mean (*n* = 3616)	1.53 (0.62)	0.42*** (0.35, 0.48)	-0.21*** (-0.26, -0.15)

***$p < .001$.

EXPLORATORY FACTOR ANALYSES FOR FCC

- Acceptable internal consistency for items at each time point ($\alpha = 0.80$; $\alpha = 0.78$).
- Initial PCFA (un-rotated) results show two factor with eigenvalues > 1.00.
  - First factor has a substantially higher eigenvalue (>3.00) than the second factor (around 1.10).
  - Most items have high loadings on first factor (> 0.50).
  - Two factors retained after rotation (each type); the two AC module items had higher loadings on the second factor.
  - Decision to proceed with single factor solution based on:
    - Surface similarity/face validity of AC and CS module items,
    - Subjectively reasonable empirical cohesiveness of the full 6-item set, and
    - Reasonable loadings of only two items onto second factor.

CFA MODEL HIGHLIGHTS

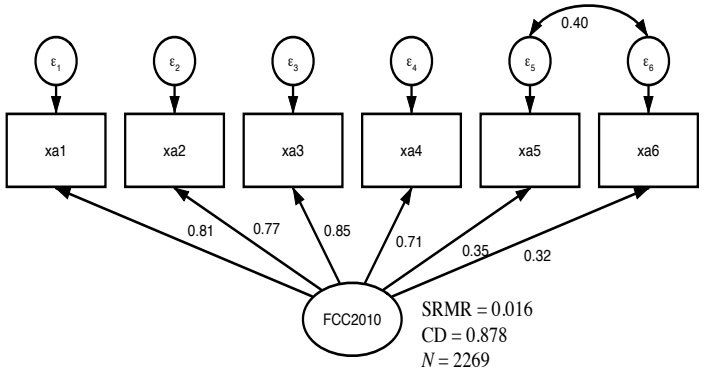


Figure 2. Standardized results for the single 2010 FCC factor solution.
CD = coefficient of determination; FCC = family-centered care; SRMR = standardized root mean squared residual.
All loadings are significant at the $p < .001$ level.

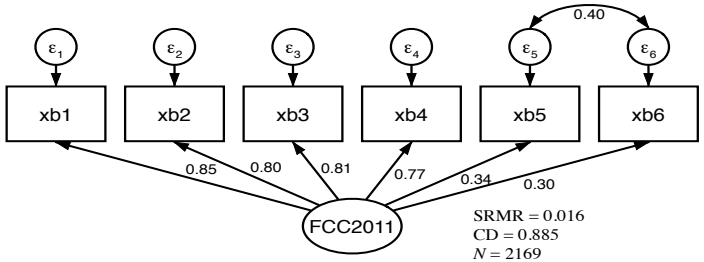


Figure 3. Standardized solution for one 2011 FCC factor solution.
CD = coefficient of determination; FCC = family-centered care; SRMR = standardized root mean squared residual.
All loadings were significant at the $p < .001$ level.

SEM OF TWO FCC LATENT FACTORS

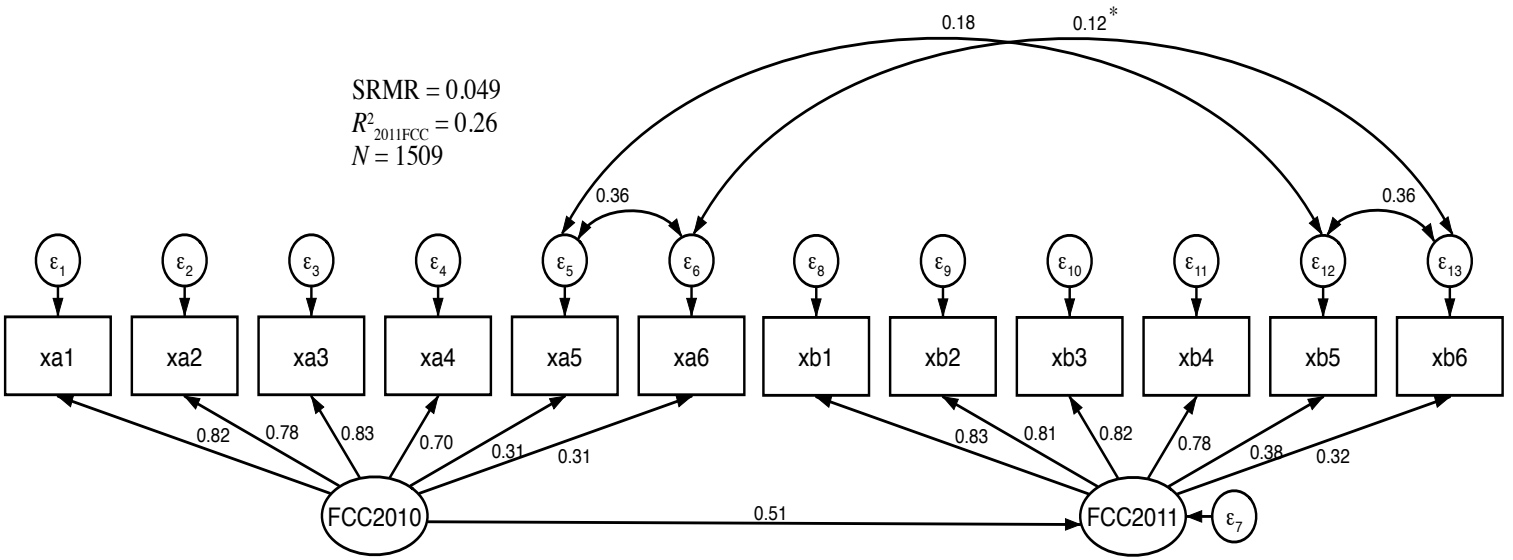


Figure 4. Standardized structural equation model of 2010 and 2011 FCC latent factors.
FCC = family-centered care; SRMR = standardized root mean square residual.
All loadings and path coefficients significant at the $p < .001$ level, unless otherwise noted ($*p < .05$).

CROSS-LAGGED PANEL MODEL

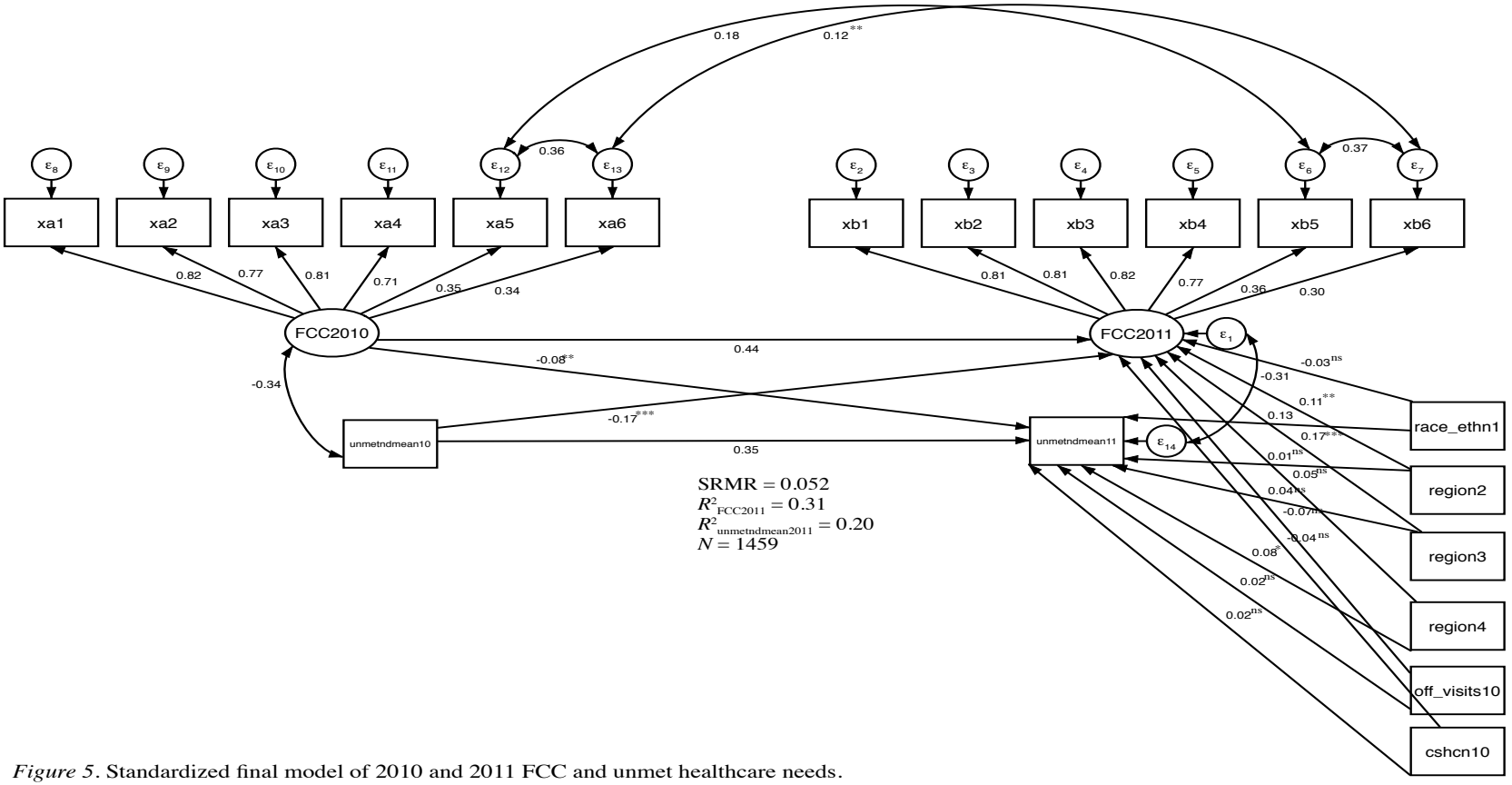


Figure 5. Standardized final model of 2010 and 2011 FCC and unmet healthcare needs.
Exogenous variable correlations were accounted for but are not shown to simplify the figure. FCC = family-centered care.
All loadings and path coefficients were significant at the $p < .001$ level unless otherwise noted: ***$p < .01$, **$p = .05$, *$p < 0.10$, ns = not significant.

TAKEAWAYS

- A FCC latent factor can be measured by six reflective indicators using the MEPS-HC.
- FCC in 2010 was positively associated with FCC in 2011.
- Mean unmet healthcare needs in 2010 was positively associated with mean unmet healthcare needs in 2011.
- FCC in 2010 was negatively associated with mean unmet healthcare needs in 2011.
- Mean unmet healthcare needs in 2010 were negatively associated with FCC in 2011.

LIMITATIONS

- Observational nature of the study
  - Selection bias
  - Unobserved variables bias
- Misspecification error
- Lack of fit indices when applying survey weights
- Missing data; relatively small sample size
  - Type II error possible due to lack of power.
- Limited time-span

FUTURE DIRECTIONS

- ✓ Develop FCC factor models including two additional binary items from the AC module previously used to measure FCC.
  - Using a statistical software package with this capability: Mplus
- ✓ Increase sample size to reduce likelihood of Type II error.
  - Combined multiple longitudinal panels (e.g., Panels 12-15)
- ✓ Include additional covariates that may confound relationships of interest.
- ✓ Treat unmet healthcare needs as an index.
- Consider additional approaches to reduce selection bias (e.g., instrumental variables, propensity scoring)

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QUESTIONS OR COMMENTS?

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Survey module	Item	Response scale	Variable name
Access to care	Thinking about the types of medical, traditional and alternative treatments that (Parent for Child) are happy with, how often does {a medical person at} (the Child's PROVIDER) show respect for these treatments?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	RESPCT2
Access to care	If there were a choice between treatments, how often would {a medical person at} (PROVIDER) ask (Parent for Child) to help make the decision?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	DECIDE2
Child preventive health	In the last 12 months, how often did doctors or other health providers spend enough time with (Your Child)?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHPRTM2
Child preventive health	In the last 12 months, how often did (Your Child)'s doctors or other health providers show respect for what you had to say?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHRESP2
Child preventive health	In the last 12 months, how often did (Your Child)'s doctors or other health providers explain things in a way that was easy to understand?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHEXPL2
Child preventive health	In the last 12 months, how often did (Your Child)'s doctors or other health providers listen carefully to you?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHLIST2

Survey section	Item	Response scale	Variable name
Child preventive health	In the last 12 months, when (Child) needed care right away, how often did (PERSON) get care as soon as you thought (he/she) needed?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHILWW2
Child preventive health	In the last 12 months, not counting times (PERSON) needed health care right away, how often did (PERSON) get an appointment for health care at a doctor's office or clinic as soon as you thought (he/she) needed?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHRTWW2
Child preventive health	In the last 12 months, how often was it easy to get the care, tests, or treatments you or a doctor believed necessary?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHENEC2
Child preventive health	In the last 12 months, how often was it easy to see a specialist that (Child) needed to see?	4-point Likert 1. Never 2. Sometimes 3. Usually 4. Always	CHEYRE2
Access to care	How difficult is it to contact {a medical person at} (PROVIDER) during regular business hours over the telephone about a health problem?	4-point Likert 1. Very difficult 2. Somewhat difficult 3. Not too difficult 4. Not at all difficult	PHNREG2
Access to care	How difficult is it to contact {a medical person at} (PROVIDER) after their regular hours in case of urgent medical needs?	4-point Likert 1. Very difficult 2. Somewhat difficult 3. Not too difficult 4. Not at all difficult	AFTHOU2

N		4,043
Population estimate		74,546,698
Predisposing characteristics		*n*
Age (years)		
M	8.60	4,043
0-5	32.8%	1,305
6-11	32.9%	1,396
12-17	34.3%	1,342
Gender		
Male	51.1%	2,067
Female	48.9%	1,976
Race/ethnicity		
White, NH	53.6%	1,305
Hispanic	23.5%	1,429
Black, NH	13.8%	902
Other Race, NH	9.1%	407
Enabling resources		
Primary household language		
English	83.1%	2,947
Spanish or other, non-English language	16.9%	1,028
Household income level		
0% - 99% FPL	23.1%	1,309
100% - 199% FPL	22.9%	1,072
200% - 399% FPL	29.5%	1,025
≥ 400% FPL	24.6%	637
Health insurance		
Any private	56.5%	1,730
Public	37.2%	2,024
Uninsured	6.3%	289
Region of residence		
Northeast	16.6%	552
Midwest	21.7%	829
South	37.4%	1,455
West	24.4%	1,046
Healthcare eed factors		
CSHCN status		
Yes	19.9%	757
No	80.1%	3,222
Annual office-based provider visits		
M	2.83	4,043

Note. CSHCN = children with special health care needs; FPL = federal poverty level; *M* = mean; NH = non-Hispanic.

SUPPLEMENTAL INFORMATION

- MEPS-HC Usual Source of Care (USC) definition:

  "The medical person, doctor's office, clinic, health center, or other place that (CHILD) usually (go/goes) if (CHILD) (is) sick or (need/needs) advice about (CHILD)'s health."