

Results from the Green House Evaluation in Tupelo, MS

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funded by the Commonwealth Fund.
Academy Health Annual Meeting,
June 26, 2005

Green House Summarized

- Radical culture change for NH-level care
- Environment, organization & philosophy
- Main elements
 - 10 elders live in self-contained houses with private rooms & baths
 - meals cooked in GH kitchen in presence of elders
 - care from CNA-level resident assistants (Shahbazim) who cook, do housekeeping, personal care, laundry, & facilitate elder development
 - Shahbazim do not report to nursing
 - All professionals (RNs, MD, SW, RT, PT, OT, etc) comprise clinical support teams that visit GHs

Green House description, cont'd

- A group of GHs are licensed as a NF
 - share administrative support & clinical support teams
- GH receives same reimbursement as any Medicaid NH
- GH meets all standards of licensure & certification
- Emphasis on quality of life for elders (quality of care is a given, but health & safety goals do not dominate model)
- GH idea developed by Bill Thomas. (more info at <http://thegreenhouseproject.com/>)

Tupelo Green Houses

- Sponsor: Cedars Health Care Center, a 140-bed traditional NH on campus of Traceway Retirement Community, owned by Methodist Senior Services of Mississippi
- Line staff trained intensively in GH model
- Elders moved from Cedars to 4 10-person GHs built in residential area of campus in May 2003
- 2 of the GHs were populated by the former residents of the locked dementia care unit
- Admission from Cedars to fill GH vacancies



Photo by: The Green House Project
Waterville, NY

Study components

- Implementation study
- Environmental study
- Business case study
- **Longitudinal study of outcomes**
 - quantitative and qualitative

Experimental design

- Quasi-experiment with 2 comparison groups
 - sample of residents remaining at Cedars NH
 - sample from Trinity Health Care, a NH of same owner in nearby city
- 4 waves of data collection
 - May-June 2003 (pre-move data)
 - 3 more times at 6 month intervals
- Respondents
 - Residents
 - Primary family caregiver
 - All Shahbazim and CNAs

Hypotheses

- Residents: ↓
 - ↑ QOL, ↑ satisfaction, ↑ social engagement
 - health no worse than in conventional “medical model”
- Family caregivers
 - ↑ engaged with residents, ↑ satisfied, ↓ burden
- Front-line staff
 - ↑ knowledgeable about residents, ↑ confident about affecting QOL, ↑ intrinsic and extrinsic job satisfaction, ↑ likelihood of staying in job
- MDS-derived QIs expected to be as good or better than conventional “medical model”

Analysis

Multivariate analysis

- 4 waves pooled and time (i.e. wave) entered as a variable
- random effects panel analysis methods
- Case mix adjustment used
- Other methods (not presented here) include comparison of change scores over time

Selection issues

- GH elders were similar in disability to those who remained at Cedars.
 - No statistically significant differences in gender, ADLs, levels of behavior problems, LOS from admission
 - Cedars residents were slightly more depressed, and cognitively impaired ($p < .05$).

Study Samples Similar at Baseline

	Cedars	Green House	Trinity
Sample size (N)	40	40	40
Female (in %)	88%	80%	75%
Age (in years, mean)	87	81	89
Average self-reported health (1-poor, 5-excellent, mean)	2.4	2.6	2.5
Cognitive impairment from MDS (0-5)	3.7*	2.8	3.2
ADL Difficulty from MDS	8.6	7.0	8.4
Depression from MDS	0.9*	0.6	0.3
Behavioral problem from MDS	1.2	0.7	1.5
LOS (in days)	1193	682	1108

*<.05, **<.01, ***<.001

Resident Outcomes

- Compared to the 2 control settings, GH residents reported a better quality of life and greater satisfaction.

Resident QOL

	Model xttobit			
Quality of Life Subscales	Cedars		Trinity	
	Coef. (S.E.)	z-value	Coef. (S.E.)	z-value
Comfort scale	-0.003 (0.057)	-0.05	-0.015 (0.067)	-0.22
Functional competence scale	-0.158 (0.147)	-1.08	0.020 (0.167)	0.12
Privacy scale	-0.580 (0.113)	-5.12***	-0.150 (0.130)	-1.15
Dignity scale	-0.562 (0.108)	-5.20***	-0.322 (0.124)	-2.60**
Meaningful activity scale	-0.185 (0.070)	-2.66**	-0.001 (0.080)	-0.01
Relationship scale	-0.331 (0.099)	-3.36**	-0.082 (0.113)	-0.73
Autonomy scale	-0.280 (0.104)	-2.68**	-0.132 (0.121)	-1.09
Food enjoyment scale	-0.625 (0.136)	-4.59***	-0.501 (0.157)	-3.20**
Spiritual well-being scale	-0.129 (0.117)	-1.10	0.268 (0.135)	1.99*
Security scale	-0.050 (0.044)	-1.13	0.009 (0.051)	0.18
Individuality scale	-0.374 (0.093)	-4.00***	-0.076 (0.108)	-0.71

Controlled for: wave, gender, age, self-reported health, length of stay, ADL (from MDS), and cognition (from MDS) *p<.05, **p<.01, ***p<.001

Resident QOL – single items

	Cedars		Trinity	
Quality of Life	Coef. (S.E.)	z-value	Coef. (S.E.)	z-value
Physically comfort CMF	-0.427 (0.148)	-2.88**	-0.383 (0.169)	-2.27*
Doing as much for yourself FC	-0.438 (0.140)	-3.12**	-0.257 (0.159)	-1.61
Having privacy PRI	-0.815 (0.152)	-5.35***	-0.444 (0.171)	-2.60**
Having choice & control AUT	-0.500 (0.132)	-3.80***	-0.234 (0.151)	-1.68
Dignity is respected DIG	-0.319 (0.161)	-1.99*	-0.134 (0.183)	-0.73
Interesting things to do MA	-0.220 (0.137)	-1.61	0.228 (0.156)	1.46
Enjoying foods ENJ	-0.477 (0.163)	-2.92**	-0.292 (0.187)	-1.56
Interest & preferences IND	-0.303 (0.151)	-2.01*	-0.081 (0.172)	-0.47
Good friendship REL	-0.436 (0.155)	-2.82**	-0.181 (0.176)	-1.03
Feel safe SEC	-0.123 (0.165)	-0.75	0.016 (0.189)	0.09
Spiritual and religion needs SWB	-0.294 (0.149)	-1.98*	0.250 (0.171)	1.46
Overall quality of life	-0.535 (0.150)	-3.57***	-0.366 (0.172)	-2.13*
QOL-sum of previous items except QOL ¹	-3.075 (0.853)	-3.60***	-0.607 (0.982)	-0.62

Controlled for: wave, gender, age, self-reported health, length of stay, adl (from MDS), and cognitive (from MDS)

*p<.05, **p<.01, ***p<.001

Residents' Satisfaction

	Model xttobit			
Overall Satisfaction	Cedars		Trinity	
	Coef. (S.E.)	z-value	Coef. (S.E.)	z-value
Place to live	-0.985 (0.144)	-6.86***	-0.742 (0.162)	-4.61***
Place to get care	-0.717 (0.139)	-5.16***	-0.390 (0.159)	-2.46*
Recommend	-0.932 (0.164)	-5.67***	-0.450 (0.184)	-2.45*

Controlled for: wave, gender, age, self-reported health, length of stay, ADL (from MDS), and cognitive (from MDS) *p<.05, **p<.01, ***p<.001

Family Outcomes

- Compared to the 2 control settings, GH family members reported greater satisfaction with their relative's care and life.
- They also reported greater satisfaction with how they as family members were treated.

Family outcomes

	Model xttobit			
	Cedars		Trinity	
	Coeff.	z-value	Coef.	z-value
Family's satisfaction in:				
Food, dining ambiance, housekeeping, disability-friendly environment (4 items)	-3.801	-8.25***	-2.487	-4.26***
Social activity (4 items)	-0.855	-1.67	0.954	1.49
Room and bath (3 items)	-5.255	-10.71***	-2.879	-4.97***
Autonomy & Relationships with staff (6 items)	-4.369	-5.23***	-3.103	-3.01**
Nursing care (5 items)	-4.564	-7.20***	-1.892	-2.44*
Experience as family (7 items)	-6.213	-5.91***	-2.871	-2.16*
Help give to resident	2.869	3.38**	2.616	2.20*
Objective burden	1.530	1.75	1.750	1.61
Subjective burden	0.416	0.46	-0.224	-0.19

Controlled for: wave and gender *<.05, **<.01, ***<.001

Staff outcomes

- Compared to the 2 control settings, staff felt more empowered to assist residents.
- They knew residents better
- They experienced greater intrinsic and extrinsic job satisfaction
- They were more likely to plan to remain in the job.

Staff outcomes

Staff Measure	Model xttobit			
	Cedars		Trinity	
	Coef.	z-value	Coef.	z-value
Staff Knowledge about residents (5 items)	-3.216	-6.04***	-0.972	-1.45
Empowerment: Belief that she can influence:#				
Resident quality of life (12 items)	-10.849	-4.77***	-9.884	-3.55***
Family experience (2 items)	-3.945	-3.99***	-3.137	-2.56*
Resident's physical health & functioning (3 items)	-1.393	-1.56	-2.728	-2.50*
Resident's emotional well-being (2 items)	-1.184	-1.84	-2.019	-2.63**

Controlled for: wave and gender *<.05, **<.01, ***<.001

each item rated from 10 (maximum influence to 1 minimum influence)

Staff Appraisal of Jobs

	Cedars		Trinity	
Ratings of job characteristics				
Sense of belonging (3 items)	-1.989	-5.84***	-1.143	-2.70**
Sense of competence (3 items)	-0.333	-1.39	-0.032	-0.11
Coworker support (3 items)	-0.642	-2.16*	0.289	0.79
Depersonalization (4 items)	0.871	3.34**	0.249	0.78
Information exchange (4 items)	-2.219	-6.02***	-1.394	-2.69**
Management support (3 items)	-1.853	-5.86***	-0.303	-0.72
Supervisor support (3 items)	-2.157	-6.22***	-0.987	-2.15*
Training (3 items)	-1.384	-5.17***	-1.008	-2.91**
Job satisfaction				
Intrinsic satisfaction (15 items)	-4.726	-6.60***	-3.532	-3.69***
Extrinsic Satisfaction (4 items)	-2.855	-6.78***	-2.422	-4.26***
Intent to stay in job (4 items)	-2.927	-5.23***	-2.841	-3.90***

Controlled for: wave and gender *<.05, **<.01, ***<.001

Quality Indicators

- MDS-based QI analyses over a 2 year period showed either no difference in QIs or statistically significant advantages for GH.
- Compared to the control settings, the GH showed less ADL decline, less prevalence of depression, less incontinence without a toileting plan, and less use of anti-psychotics without a relevant diagnosis.

Quality Indicators

Variable	Cedar (N=109)		Trinity (N=69)	
	OR	Std. Dev.	OR	Std. Dev.
qi1 Incidence of New Fracture	0.38	0.39	0.54	0.51
qi2 Prevalence of fall	1.99	0.85	1.96	0.89
qi3 Prevalence of behavioral Symptom	0.55	0.30	1.79	1.06
qi4 Prevalence of depression	2.65*	1.16	3.34*	1.56
qi5 Prevalence depression without antidepressant	1.68	1.05	1.57	1.09
qi6 Use of 9 or more medications	0.45	0.34	0.26	0.21
qi7 incidence of cognitive impairment	1.97	1.36	0.44	0.33
qi8 Prevalence of incontinence	1.97	1.36	0.44	0.33
qi9 Prevalence of incontinence without toilet plan	11.0*	13.1	62.8**	95.9
qi10 Prevalence of indwelling catheters	1.06	1.17	1.42	1.91
qi11 Prevalence of fecal impaction	n/a	n/a	n/a	n/a
qi12 Prevalence of urinary tract infections	1.06	0.43	2.37*	0.67

Quality Indicators

Variables	Cedar (N=109)		Trinity (N=69)	
qi13 Prevalence of weight loss	0.91	0.29	0.88	0.30
qi14 Prevalence of tube feeding	0.04	0.07	0.002	0.007
qi15 Prevalence of dehydration	n/a	n/a	n/a	n/a
qi16 Prevalence of bedfast residents	3.94	3.28	0.18	0.20
qi17 Inc. of decline of late loss ADL	3.54***	1.10	5.72***	1.98
qi18 Inc. of decline of ROM	0.82	0.37	0.43	0.23
qi19 Prevalence of antipsychotic use	5.06**	3.05	0.31	0.24
qi20 Prevalence of anti-anxiety / hypnotic use	0.85	0.57	3.75	2.77
qi21 Prevalence of hypnotic use > 2 times	3.45	4.50	4.21	8.17
qi22 Prevalence of daily physical restraints	0.97	7.55	0.57	0.48
qi23 Prevalence of little or no activity	12.26***	8.41	0.73	0.54
qi24 Prevalence of stage 1-4 pressure ulcer	2.59	1.95	2.99	2.36

* p<.05; ** p<.01; *** p<.001

Control variables: age, gender, ADLs, cognition, and wave, except in qi17 where ADL was not used.

Conclusions

- Outcome findings robust in support of GH for residents, family, and staff compared to Cedars , Trinity, or both
- Almost no negative findings
- Staff findings striking, suggesting staff empowerment is possibly a vehicle for resident outcomes
- Sponsor implementing 100% GHs
- Many other GHs under development

Next steps for present study

- For first 4 GHs
 - More analysis, including open-ended items
 - Analysis of 100+ exit interviews from former staff and from families of deceased residents from GH and comparison settings
 - Environmental analyses
 - Comparisons of specific GHs
 - Business case data
 - Implementation issues

Studies of Tupelo expansion

- Full scale 100% GH will permit:
 - insight on managing a larger collection of GHs & utilizing centralized staff
 - examining admission direct from community
 - Studying integration of new elders & staff into GHs on larger scale
 - Comparing 10-person & 12-person GHs
 - MDS QIs for full GH

Thank you

- To the Commonwealth Fund
- To all the respondents in Mississippi
- And to all of you for listening

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