Does improving end-of-life cancer care require reforming clinical care or system capacity?

Hospital-specific analyses from the *Dartmouth Atlas of Healthcare* Project

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Percent of Decedents Enrolled in Hospice During the Last Six Months of Life by HRR (2001-05)

- 40% to 60% (58)
- 35% to < 40% (42)
- 30% to < 35% (58)
- 25% to < 30% (63)
- 10% to < 25% (85)
- Not Populated
Want to spend last days in the hospital...?

National random survey of 2,847 community dwelling Medicare beneficiaries > 65 years 2003:

<table>
<thead>
<tr>
<th></th>
<th>Non Hispanic White</th>
<th>Hispanic</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>In a hospital</td>
<td>8.0 (6.8-9.2)</td>
<td>15.2 (9.6-23.4)</td>
<td>17.7 (14.4-21.6)</td>
<td>16.3 (10.1-25.3)</td>
</tr>
<tr>
<td>In a nursing home</td>
<td>5.2 (4.3-6.2)</td>
<td>1.9 (0.5-7.3)</td>
<td>7.7 (5.6-10.6)</td>
<td>4.4 (1.6-11.0)</td>
</tr>
<tr>
<td>At home</td>
<td>86.9 (85.3-88.3)</td>
<td>82.9 (74.4-88.9)</td>
<td>74.6 (70.3-78.4)</td>
<td>79.4 (69.9-86.4)</td>
</tr>
</tbody>
</table>


Percent of Deaths Occurring in Hospital among Chronically Ill Patients by HRR (2001-05)
End of Life Cancer Care Research Team

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End of Life Cancer Cohorts

- 2003-07 20% age 66 – 99 who died & had a discharge or 2 clinician visits with diagnosis poor prognosis cancer in last 6 months of life.
- And who were admitted to a hospital in the last year of life.
- Patients assigned to the hospital with the majority of inpatient days.
- Adjusted for age, sex, race, cancer type, mix of other chronic disease, MHHI (ZIP), bed supply (HSA), hospital for profit status.
- Stratified by hospital type: NCI cancer center, AMC, community hospital.
- GENMOD multilevel models with patient as the unit of analysis.
Percent dying in hospital
NCI Cancer Centers and Academic Medical Centers (non-NCI)

Westchester Medical Center 57.1
New York Methodist Hospital 54.9
New York-Presbyterian Hospital 46.2
Robert Wood Johnson Univ, NJ 42.4

Univ of Wisconsin Hosp & Clinics 22.5
Univ of Washington Med Ctr 21.3
St. Joseph’s Med Ctr, Phoenix 18.9
Evanston Northwestern 18.7

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers

Hospice days in last month of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

University Med Ctr-Lubbock 12.5
Univ of Iowa Hosp & Clinics 12.4
MUSC Medical Center 12.0
University of Alabama Hospital 11.5

City of Hope National Med Ctr 6.0
New York-Presbyterian Hospital 3.7
Montefiore Medical Center 3.0
Westchester Medical Center 2.9

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
Hospital days during last month of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

New York Methodist Hospital 8.4
Westchester Medical Center 8.4
New York-Presbyterian Hospital 7.3
Robert Wood Johnson Univ 6.8
Univ of Washington Med Ctr 3.9
St. Joseph Mercy Hospital 3.9
Univ of Iowa Hosp & Clinics 3.8
Univ of California Davis Med Ctr 3.5

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers

ICU days during last month of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

Allegheny General Hospital 4.3
Cooper Health System 3.7
Nebraska Medical Center 3.1
UCLA Medical Center 2.9
Dartmouth-Hitchcock Med Ctr 0.7
Memorial Sloan-Kettering 0.6
St. Francis Hospital & Med Ctr 0.4
Fletcher Allen Health Care 0.4

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
Percent receiving chemotherapy during last two weeks of life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

- Cedars-Sinai Medical Center: 12.3%
- Lenox Hill Hospital: 11.6%
- Univ of Tennessee Med Ctr: 8.3%
- Robert Wood Johnson Univ: 6.9%
- Carolinas Medical Center: 4.7%
- Hartford Hospital: 3.5%
- UPMC Presbyterian Shadyside: 3.3%
- Memorial Sloan-Kettering: 1.4%

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers

Percent seeing 10 or more physicians
in the Last 6 Months of Life
NCI Cancer Centers and Academic Medical Centers (non-NCI)

- North Shore University Hospital: 82.0%
- Allegheny General Hospital: 79.4%
- Memorial Sloan-Kettering: 75.6%
- MedStar-Georgetown Med Ctr: 72.7%
- University of Alabama Hospital: 38.5%
- Univ of Wisconsin Hosp & Clinics: 34.7%
- University of Kentucky Hospital: 33.6%
- Oklahoma University Med Ctr: 26.9%

Green dots = highest & lowest NCI cancer centers
Red dots = highest & lowest academic medical centers
End-of-life care may reflect broader problems in health care systems

- Uneven quality.
- An emphasis on subspecialty care, imaging, tests, procedures, with the goal of curing disease.
- An assumption that more care, and more costly is better.
- Care decisions dominated by the values of health care professionals.
- Who is asking and listening about patient and family preferences.

Changing end-of-life care may require macro system reforms

From the SUPPORT study...
- Most patients expressed a preference to die at home.
- Most died in the hospital. Varied across SUPPORT sites: 23-54%.
- Variation was not explained by socio-demographic or clinical characteristics.
- The most powerful predictor of death in a hospital (versus other setting) was area hospital bed supply.

TABLE 4 -- Odds of Death Occurring in the Hospital among SUPPORT Patients Associated with Health System Characteristics of HRR of Residence of Patient

<table>
<thead>
<tr>
<th>Characteristics of HRR of SUPPORT Patient Residence</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital days per 1000 (per 1000 day increment)</td>
<td>3.32</td>
<td>1.00, 11.1</td>
</tr>
<tr>
<td>% Residing in nursing homes (per increase of 10%)</td>
<td>1.07</td>
<td>0.64, 1.82</td>
</tr>
<tr>
<td>% Medicare HMO enrollment (per increase of 10%)</td>
<td>1.04</td>
<td>0.97, 1.12</td>
</tr>
<tr>
<td>Medicare expenditures per beneficiary for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home health (per $100 increment)</td>
<td>0.84</td>
<td>0.58, 1.24</td>
</tr>
<tr>
<td>Hospice (per $100 increment)</td>
<td>0.25</td>
<td>0.05, 0.85</td>
</tr>
<tr>
<td>Skilled nursing (per $100 increment)</td>
<td>0.70</td>
<td>0.21, 2.35</td>
</tr>
<tr>
<td>Primary care MDs per 100,000 (increment of 10)</td>
<td>0.57</td>
<td>0.29, 1.12</td>
</tr>
<tr>
<td>Specialist MDs per 100,000 (increment of 10)</td>
<td>1.31</td>
<td>1.05, 1.65</td>
</tr>
</tbody>
</table>


Does improving end-of-life cancer care require only reforming clinical Microsystems or also health care system capacity and organization?