Equity of accessibility to dialysis facilities

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Nephrology and dialysis units of the Limousin region
2007 ESRD incidence: regional diversity standardized rate 139 pmp [135 - 142]
2007 dialysis prevalence: regional diversity

standardized prevalence: 536 pmp [529 - 544]
Objectives

Improving the quality of care leads to adapt the offer of care according to the demand and to ensure the equity of accessibility to health care facilities.

Our aim here was to assess the spatial accessibility to care units, given the current distribution of dialysis modalities, and to build scenarios for optimizing travel times.
IS: organizational scheme

COLLECT
- Application for data entry
- Dynamic panels and GIS

VALIDATE
- Tools for quality control
- Data processor

REPORT

RE-ORGANIZE
a subject-oriented, integrated, time-variant and non-volatile collection of data in support of management's decision making process.

W.H. Inmon, Prism 1995
Geographic Information System (GIS)

A collection of computer hardware, software, used to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

Web use of general functions of GIS Interactivity (Flash), Dynamic connection to the data warehouse (Mysql, Php, Java), Large and unlimited access to health professionals and decision makers.
SIG: dynamic representation
Observed Distances to dialysis centre
Observed travel times to dialysis centre
Methods: exploring accessibility

- **Description of observed time to care unit:**
  - Geographically: inter-regional differences
  - according to the modalities of treatment: Dialysis Center, Medicalized dialysis unit, Autodialysis unit

- **Travel times:**
  estimated via Loxane Way Server and Google

- **How a spatial approach might aid for health organization?**
  - Example of scenarios of modification of the offer of care
Methods: Two floating catchment area

• “Floating catchment method” to identify zones lacking dialysis structures.
• A circle (catchment) around each centroid is the basic unit for calculating the ratio physician/population.
• The rayon represents the “reasonable” distance to cover towards the care unit.
• Moving the circle here and there for identifying the zones lacking dialysis structures.
Two floating catchment area
Observed travel times: centres

Distribution of travel times observed by region: treatment in Centre
7743 patients

- Centre: 731 patients
- Ch. d'Est: 331 patients
- Ile-de-France: 3336 patients
- Lyon-Rhône: 873 patients
- Limousin: 130 patients
- Midi-Pyrénées: 842 patients
- PACA: 1500 patients

Time (min): 0-120
Number of patients: 0-7743

Mean travel time: 30 minutes
Observed travel times: autodialysis

Distribution des temps de trajet observés par région : traitement en ATD
2755 patients

Temps du trajet (min)
0 20 40 60 80 100 120
30 patients 50 patients

Centre 381 patients
Ch-And. 154 patients
IdF 91 patients
Lang-R. 284 patients
Limocel 45 patients
Mid-P. 377 patients
PACA 602 patients
Observed vs estimated travel times

Ile-de-France: 3336 patients

Champagne-Ardenne: 331 patients
Example of scenarios for an aid to decision making

- ascertaining the geographical zones of low accessibility (time>threshold)
- Evaluating the population concerned
- evaluating the number of ESRD patients concerned
Modelling offer to demand of care for ESRD treated by dialysis
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Modelling the offer to the demand of care for ESRD treated by dialysis

Health care accessibility as of 31 December 2005

Scenario: in-centre dialysis unit in Guéret
Discussion

• The remoteness from a dialysis unit has important implications for patients considering the impact on their quality of life since they need accessing their dialysis centre three times a week.

• It also impacts the economic costs of reimbursements for the national Medical insurance.

• Transports to dialysis units represent an important part of the dialysis costs.
Discussion: limitations

- the feasibility of creating in-centre units is bound by economical constraints and by the difficulty to recruit physicians in rural areas.

- If 90% of patients are currently treated in the nearest unit, it doesn’t mean that they will opt for changing of dialysis unit in case of creation of a new one.

- We considered no limitation in adapting patients’ recruitment capacity for a given unit.
Discussion: limitations

• A small fraction of still working patients can’t easily choose between different dialysis units.
• Finally, the scenario supposes that ESRD patients are always treated according to the more appropriate modality, a status which has not been clearly established yet.
• Future scenarios are in process to analyse the impact of modifying the distribution of treatment modalities, evaluating for instance the ability to develop peritoneal dialysis for the treatment of elderly at home.
Discussion

- It is critically important to articulate the supply and demand of health services and to understand how these two factors might better match in the future in order to provide appropriate accessibility for the population,
- with a continuous monitoring of health care planning based on registry data.
- This work highlights organizational issues that will be encountered in the near future according to ageing.
- It emphasizes important issues related to health care planning to cope with the accessibility to dialysis facilities considering the evolving patterns of ESRD epidemiology.
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