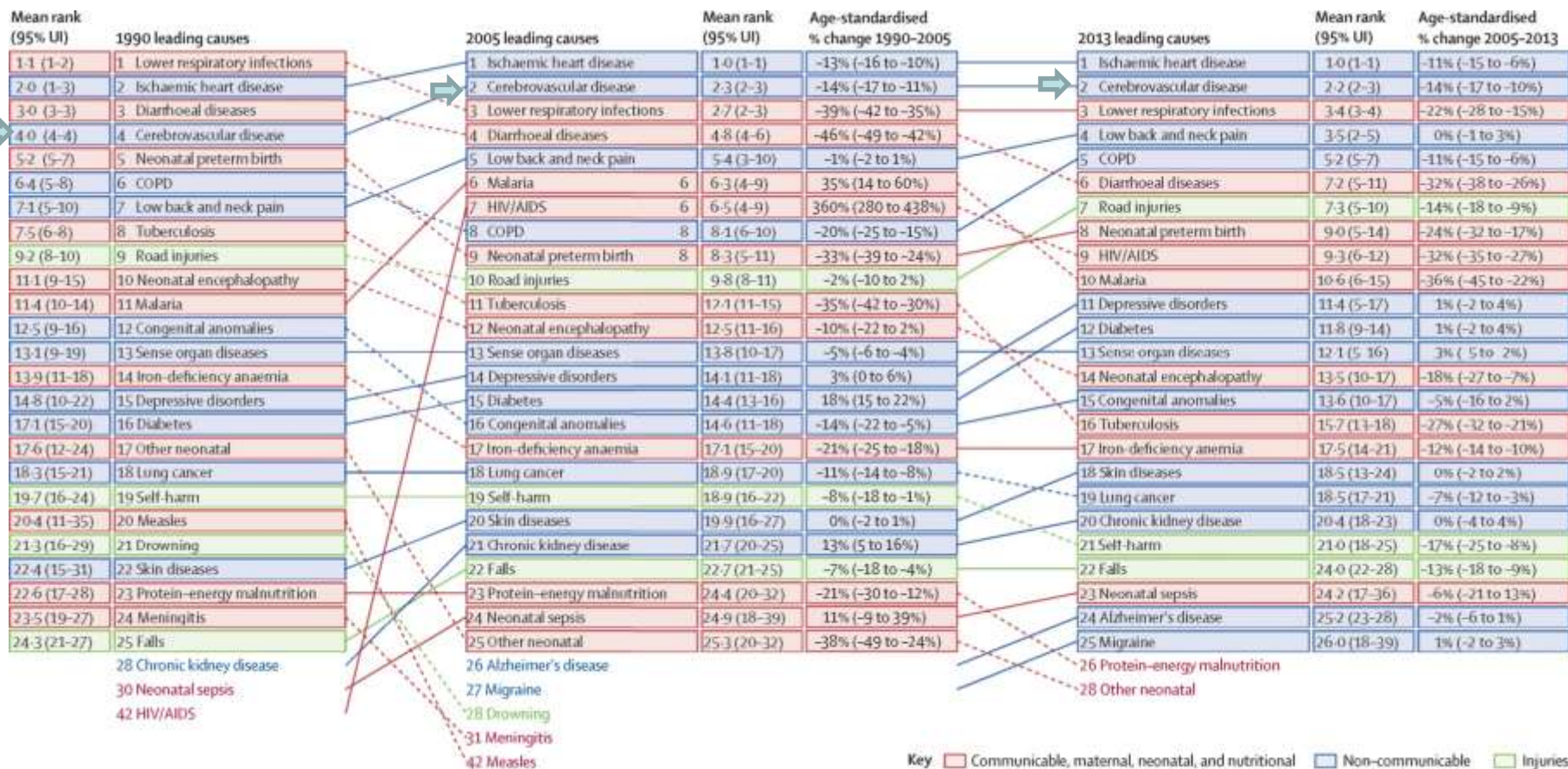


Results from the French PMSI database and the health-disability study regarding stroke rehabilitation

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Stroke in the world, WHO 2012

DALYs (Disability Adjusted Life Years)

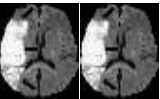


Stroke epidemiology

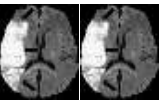
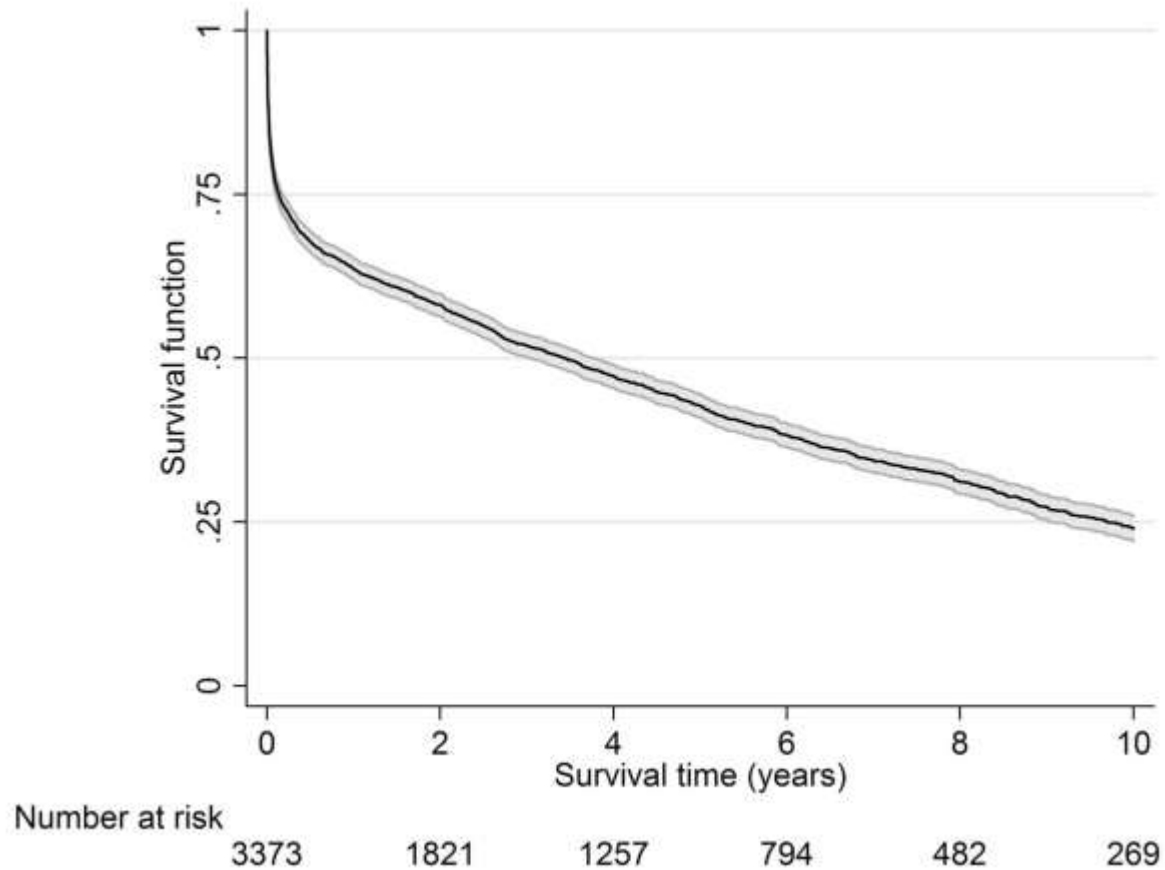
A lot of studies... at the acute phases

Table 2 Population studies for cerebrovascular disease epidemiology

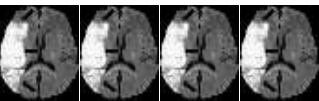
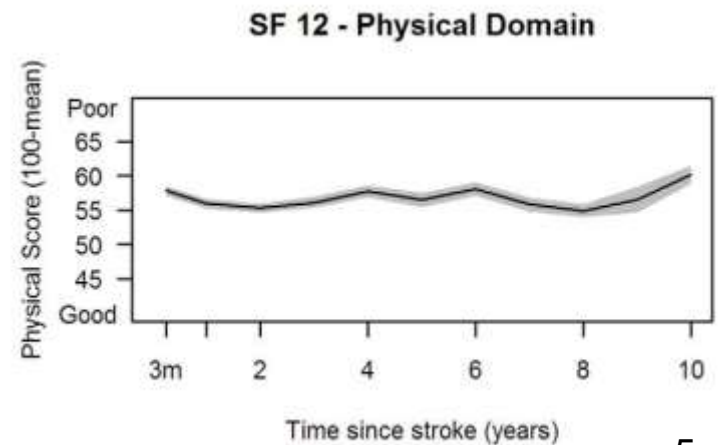
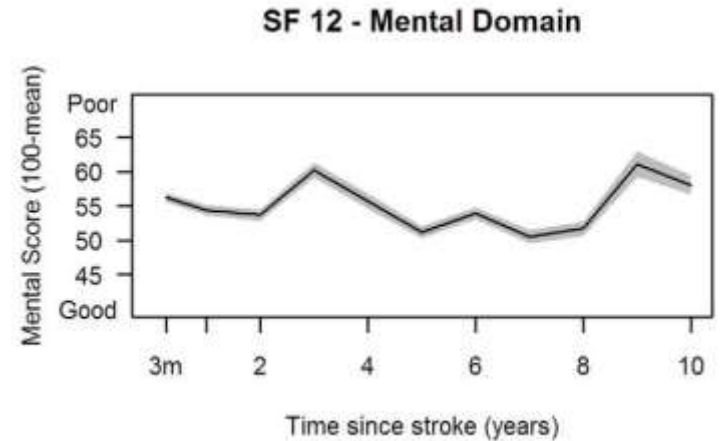
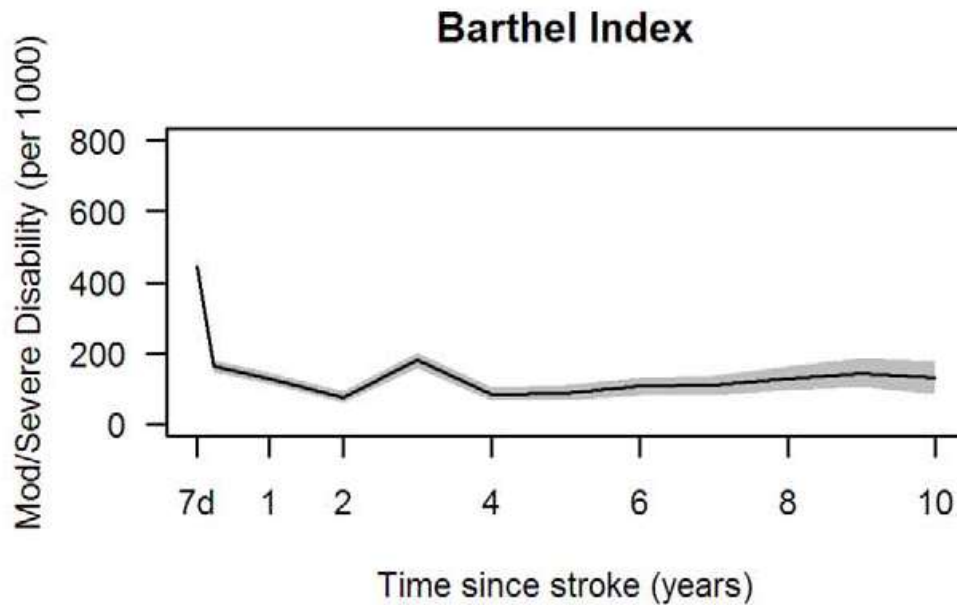
| Study population | Ref. | Years | WHO Region | Sample size | Information available |
|---|-------|---------------------|------------|--------------------------------------|--|
| Sweden (S) | 54 55 | 1975-78 and 1983-88 | EUR-A | 723 first-ever strokes | Incidence, 3 years survival |
| Arcadia (G) | 56 57 | 1993-95 | EUR-A | 555 first-ever strokes | Incidence, 28 day case fatality, one year survival, disability in stroke survivors |
| Oxfordshire Community Stroke Project (UK) | 58 59 | 1981-86 | EUR-A | 675 first-ever strokes | Incidence, 30 day case fatality, 6 years survival, one year disability |
| London (UK) | 60 61 | 1995-1997 | EUR-A | 911 first strokes | Incidence, 28 day case fatality, one year survival |
| Innherred (N) | 62 | 1994-96 | EUR-A | 593 strokes; 432 first-ever strokes | Incidence, 30 day case fatality |
| Frederiksberg (DK) | 63 | 1972-90 | EUR-A | 262 first-ever strokes (1989-90) | Incidence |
| L'Aquila (I) | 64 | 1994-98 | EUR-A | 819 first-ever strokes | Incidence, 30 day case fatality, survival at one year, disability at one year |
| Belluno (I) | 65 | 1992-93 | EUR-A | 474 first-ever strokes | Incidence, 30 day case fatality |
| Valle D'Aosta (I) | 66 67 | 1996-97 | EUR-A | 343 first-ever strokes | Incidence, 30 day case fatality, disability at 30 days |
| Finland (three populations) | 68 | 1972-91 | EUR-A | 244, 255, and 594 first-ever strokes | Incidence, one month case fatality |
| Erlangen (G) | 68 69 | 1995-97 | EUR-A | 572 first strokes | Incidence, 28 day case fatality, one year survival |
| Dijon (F) | 69 | 1995-97 | EUR-A | 591 first strokes | Incidence, 28 day case fatality, one year survival |
| NW England (UK) | 70 | 1994-95 | EUR-A | 932 strokes; 642 first-ever strokes | Incidence, 28 day case fatality |
| NEMESIS (AU) | 71 | | WPR-A | 381 strokes; 276 first-ever strokes | Incidence, 28 day case fatality, disability in stroke survivors, one year survival |
| Perth (AU) | 72 73 | 1995-96 | WPR-A | 290 strokes; 213 first-ever strokes | Incidence, 28 day case fatality, stroke severity, five year survival, cause of death, long term disability |
| Auckland (NZ) | 74 75 | 1991 | WPR-A | 953 first-ever strokes | Incidence, 28 day case fatality, stroke prevalence, follow-up of survivors |
| Rochester (US) | 76 | 1955-89 | AMR-A | 496 first-ever strokes (1985-89) | Incidence, 28 day case fatality, stroke severity, follow-up of survivors, prevalence |



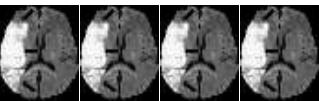
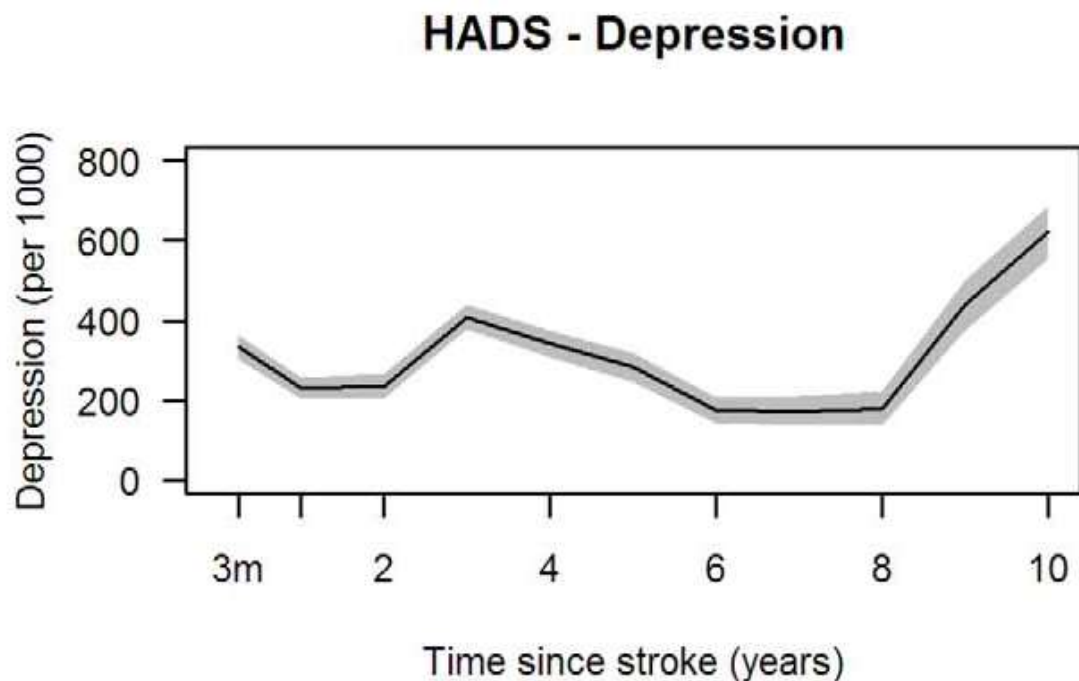
Charles D. A. Wolfe. Estimates of Outcomes Up to Ten Years after Stroke:
Stroke:
Analysis from the Prospective South London Stroke Register. Plos One
2011



Charles D. A. Wolfe. Estimates of Outcomes Up to Ten Years after Stroke: Stroke: Analysis from the Prospective South London Stroke Register. Plos One 2011

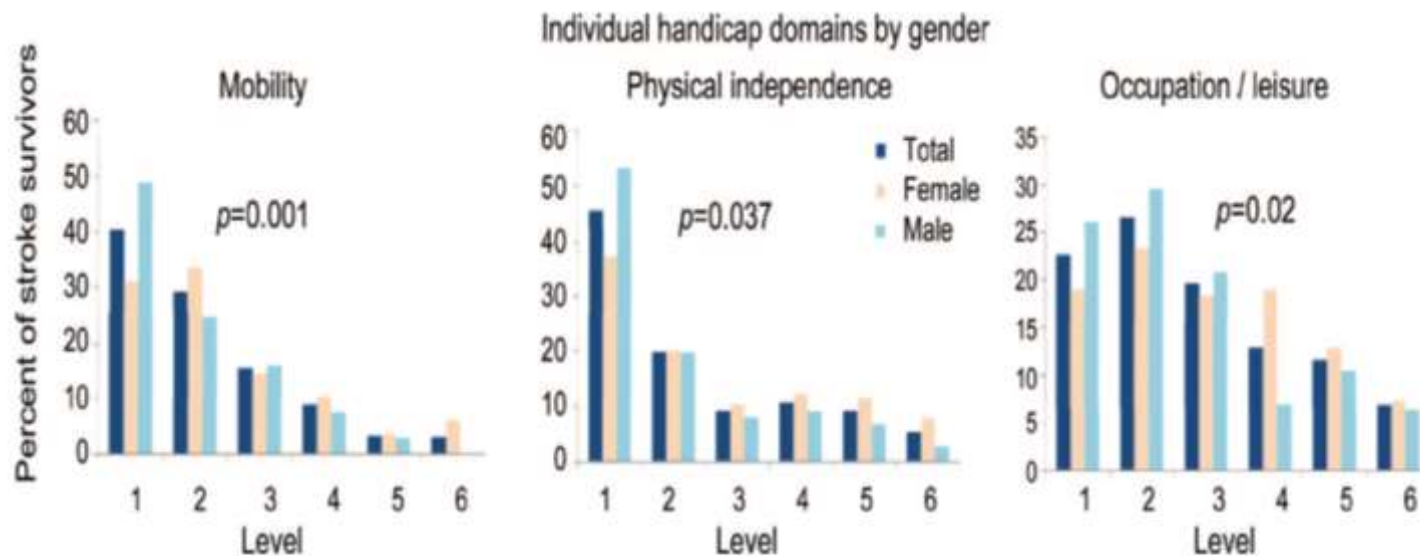


Charles D. A. Wolfe. Estimates of Outcomes Up to Ten Years after Stroke:
Stroke:
Analysis from the Prospective South London Stroke Register. Plos One
2011

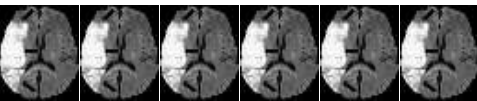


V.L. Feigin. Auckland Stroke Outcomes Study. Part 1: Gender, stroke types, ethnicity, and functional outcomes 5 years poststroke. Neurology 2010.

Figure 2 Proportional frequency of disadvantages on individual handicap domains (London Handicap Scale) 5 years after stroke in Auckland, New Zealand, by gender (mobility, physical independence, occupation/leisure)



Level 1 = no disadvantage, level 2 = very slight disadvantage, level 3 = quite a lot of disadvantage, level 4 = very much of disadvantage, level 5 = severe disadvantage, level 6 = extreme disadvantage. *p* Values refer to the global test across all categories within the domains. See figure e-1 for proportional frequency by gender (social integration, orientation, economic self-sufficiency), pathologic type of stroke, and ethnicity: the Auckland Stroke Outcomes study.



Prevalence of self-reported stroke and disability in the French adult population: a transversal study

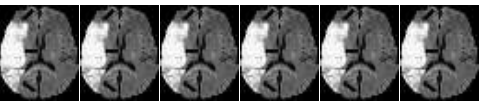
Alexis Schnitzler (MD)¹, France Woimant (MD PhD)², Philippe Tuppin (MD, PhD)³, Christine de Peretti (MD, PhD)⁴

¹ Médecine Physique et de réadaptation, Hôpital Raymond Poincaré, AP-HP, UVSQ (EA 4497), 104 Boulevard Raymond Poincaré 92380 Garches, France

² Neurologue, Agence régionale de santé d'Île de France, 35 rue de la Gare 75935 Paris Cedex 19, hôpital Lariboisière APHP, 2 rue A Paré 75010 Paris

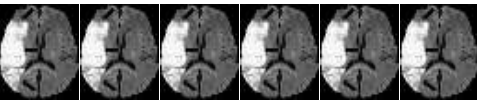
³ Epidémiologiste, Caisse nationale d'assurance maladie des travailleurs salariés, 26-50 avenue du Professeur Lemierre - 75986 Paris Cedex 20

⁴ Epidémiologiste, Institut de veille sanitaire, 12 rue du Val d'Osne, 94 415 -Saint-Maurice Cedex



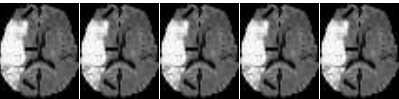
Stroke in France

- Prévalence:
 - 1,2% of the french population self reported a stroke
 - 0,8% of the french population self reported disability after a stroke
- What kind of disability?
- Comparaison with no-stroke people ?

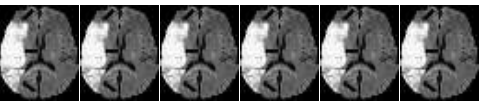
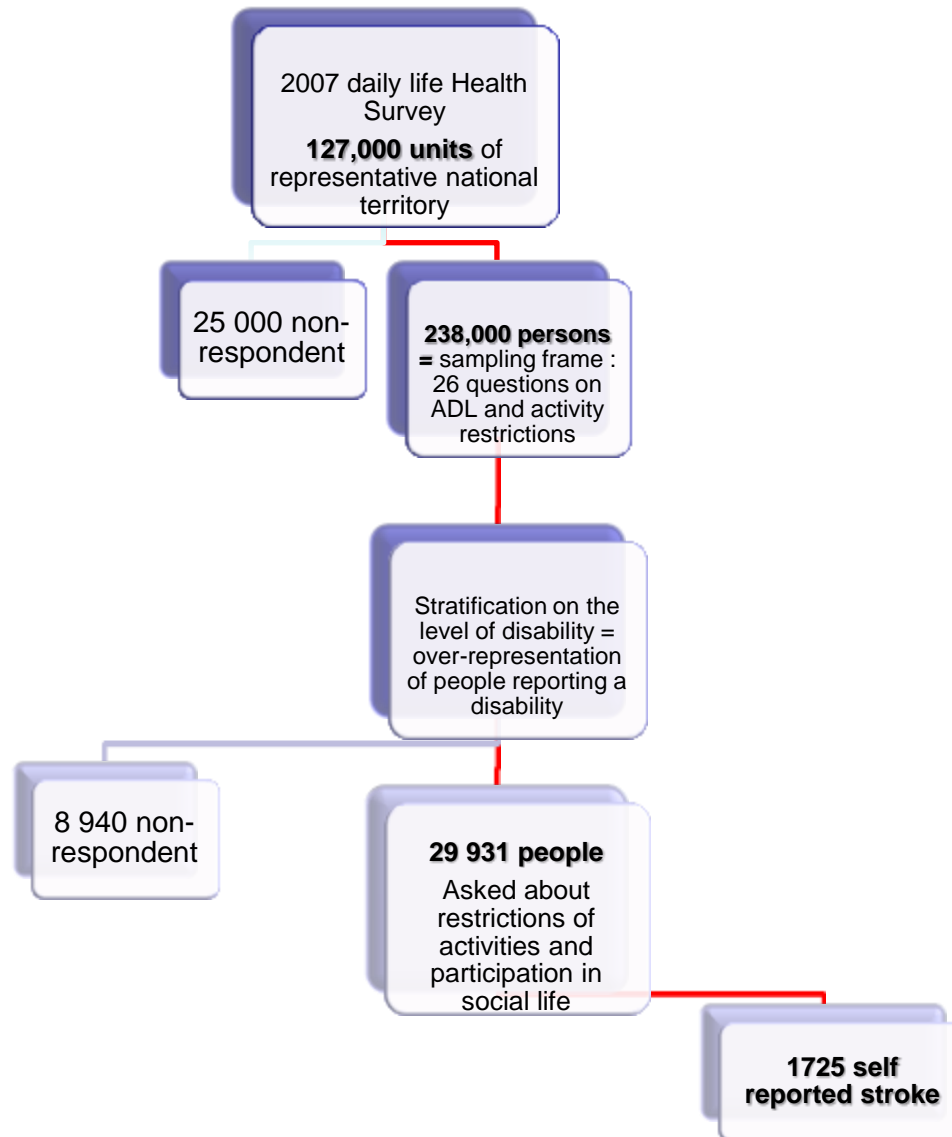


Méthods

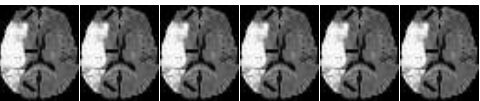
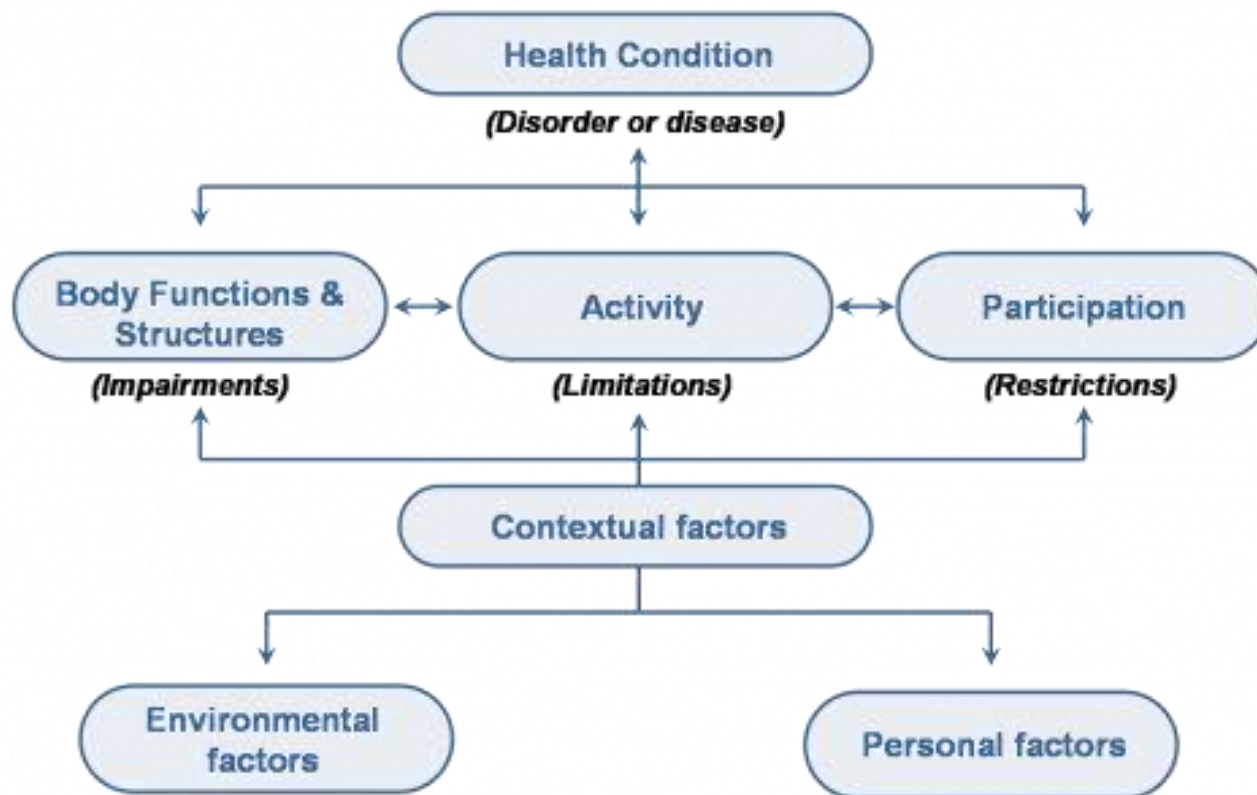
- The “Disability Health” survey was carried out in people’s homes (DHH) and in institutions (DHI) in France.
- Data regarding medical history and level of independence and disability, joint stiffness, motor deficit and medical and paramedical care were self-reported
- Persons under 18 years old or in a vegetative state were excluded.



Méthod



Méthod: based on the ICF concept



Module B2 - Santé - La carte des maladies

Présenter la CARTE n°1 du cahier des cartes

BMALA. Avez-vous ou avez-vous déjà eu une de ces maladies ou problèmes de santé ?

Instruction enquêteur : il n'y a pas de période de référence : il faut donc noter toutes les maladies que la personne a déjà eues

- Refus
- Ne sait pas

Si aucune de ces maladies ou problèmes de santé, refus ou ne sait pas, passer à la question

BSYMPIT (voir page 42)

La carte s'affiche sous CAPI et l'enquêteur coche les maladies citées et si les maladies citées sont 21, 49, 50 ou 51 l'enquêteur note en plus le libellé de la maladie.

Maladies ou problèmes cardio-vasculaires

- 1 : Infarctus du myocarde
- 2 : Maladies des artères coronaires, angine de poitrine, angor (hors infarctus du myocarde)
- 3 : Hypertension artérielle
- 4 : Accident vasculaire cérébral, attaque cérébrale (hémorragie cérébrale, thrombose cérébrale)
- 5 : Insuffisance cardiaque
- 6 : Artérite des membres inférieurs (maladie des artères)
- 7 : Varices, ulcères variqueux, insuffisance veineuse
- 8 : Troubles du rythme
- 9 : Hémorroïdes

Cancer(s)

- 10 : Cancer (toutes les tumeurs malignes y compris les leucémies et les lymphomes)

Maladies respiratoires

- 11 : Asthme (y compris l'asthme d'origine allergique)
- 12 : Bronchite chronique, broncho-pneumopathie chronique obstructive (BPCO), emphyseme
- 13 : Rhinite allergique (rhume des foins), conjonctivite allergique

Maladies ou problèmes concernant les os et les articulations

- 14 : Lumbalgies (douleurs des reins) et autres atteintes chroniques du dos
- 15 : Cervicalgies (douleurs du cou) et autres anomalies cervicales chroniques
- 16 : Scoliose, cyphose, déformations de la colonne vertébrale
- 17 : Polyarthrite rhumatoïde
- 18 : Autres arthrites (inflammation des articulations)
- 19 : Arthrose du genou (dégénérescence des articulations)
- 20 : Arthrose de la hanche
- 21 : Arthrose autres localisations
- 22 : Ostéoporose

Maladies ou problèmes digestifs

- 23 : Ulcère de l'estomac ou du duodénum
- 24 : Cirrhose du foie, maladie chronique du foie
- 25 : Allergies alimentaires

Maladies endocriniennes et métaboliques

- 26 : Diabète
- 27 : Problèmes thyroïdiens (hyperthyroïdie, hypothyroïdie, goitre)

Maladies ou problèmes neurologiques

- 28 : Maux de têtes importants, migraines
- 29 : Epilepsie
- 30 : Maladie d'Alzheimer et autres maladies du même type
- 31 : Maladie de Parkinson
- 32 : Sclérose en plaque

Maladies ou problèmes psychiques ou mentaux

- 33 : Anxiété chronique
- 34 : Dépression chronique
- 35 : Autisme
- 36 : Schizophrénie
- 37 : Trisomie 21

Maladies ou problèmes urinaires ou génitaux

- 38 : Incontinence urinaire (fuites urinaires)
- 39 : Calcul urinaire
- 40 : Cystites, infections urinaires fréquentes
- 41 : Adénome de la prostate

Maladies ou problèmes de peau

- 42 : Psoriasis
- 43 : Allergies cutanées, eczéma,
- 44 : Escarres

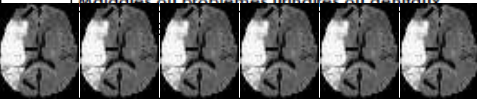
Maladies ou problèmes oculaires

- 45 : Cataracte
- 46 : Glaucome
- 47 : Strabisme

Autres maladies

- 48 : Blessures ou séquelles permanentes causées par un accident
- 49 : Autres troubles neurologiques
- 50 : Autres troubles psychiques ou mentaux
- 51 : Autre(s) maladie(s)

52 : Aucune maladie ou problème de santé



Filter : si DEFQMOUV = 1 :

Préserver la CARTE n°4 du cahier des cartes (plusieurs réponses possibles)

DEF1PARA. Quelle(s) partie(s) de votre corps est (sont)-elle(s) paralysée(s) complètement?

- Quatre membres
- Deux membres inférieurs
- Membre supérieur et inférieur du même côté (droit ou gauche)
- Membre supérieur (droit ou gauche)
- Membre inférieur (droit ou gauche)
- Paralyse faciale
- Main d'un seul côté
- Main des deux côtés
- Avant-bras d'un seul côté
- Avant-bras des deux côtés
- Pied d'un seul côté
- Pied des deux côtés
- Jambe d'un seul côté
- Jambe des deux côtés

Filter : si DEFQMOUV = 2 :

Préserver la CARTE n°4 du cahier des cartes (plusieurs réponses possibles)

DEF2PARA. Quelle(s) partie(s) de votre corps est (sont)-elle(s) paralysée(s) partiellement?

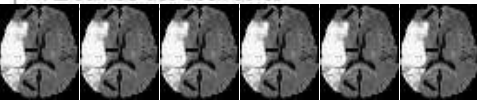
- Quatre membres
- Deux membres inférieurs
- Membre supérieur et inférieur du même côté (droit ou gauche)
- Membre supérieur (droit ou gauche)
- Membre inférieur (droit ou gauche)
- Paralyse faciale
- Main d'un seul côté
- Main des deux côtés
- Avant-bras d'un seul côté
- Avant-bras des deux côtés
- Pied d'un seul côté
- Pied des deux côtés
- Jambe d'un seul côté
- Jambe des deux côtés

Filter : si DEFQMOUV = 5 :

Préserver la CARTE n°4 du cahier des cartes (plusieurs réponses possibles)

DEF5PARA. Quelle(s) partie(s) de votre corps est (sont)-elle(s) touchée(s) par une limitation de la force musculaire?

- Quatre membres
- Deux membres inférieurs
- Membre supérieur et inférieur du même côté (droit ou gauche)
- Membre supérieur (droit ou gauche)
- Membre inférieur (droit ou gauche)
- Paralyse faciale
- Main d'un seul côté
- Main des deux côtés
- Avant-bras d'un seul côté
- Avant-bras des deux côtés
- Pied d'un seul côté
- Pied des deux côtés
- Jambe d'un seul côté
- Jambe des deux côtés



Module D - Aides techniques

IntroD : Nous allons maintenant aborder les aides techniques que vous utilisez habituellement dans vos activités quotidiennes.

Préserver la CARTE n°8 du cahier des cartes

DPROTU. Pouvez-vous me dire quelles aides techniques/prothèses vous portez/utilisez ?

La carte s'affiche sous CAPI et l'enquêteur coche

Prothèses et implants

1. Prothèse de la hanche
2. Prothèse de genou
3. Prothèse des membres supérieurs (doigt, main ou bras artificiel,...)
4. Prothèse des membres inférieurs à l'exclusion de la hanche et du genou (pied ou jambe artificielle...)
5. Autre prothèse (œil de verre, prothèse mammaire, prothèse de nez...)

appareillage de soutien, de maintien ou de correction de la position du corps

6. Appareillage du tronc ou de la colonne vertébrale (corset...)
7. Appareillage des membres supérieurs
8. Appareillage des membres inférieurs (chaussures orthopédiques...)
9. Autre appareillage de soutien, de maintien ou de correction de la position du corps

aides pour les soins personnels et la protection

10. Sonde ou un collecteur d'urines (système d'évacuation de l'urine)
11. Protections absorbantes (couches)
12. Vêtements adaptés
13. Aides pour stomisés (poches, absorbants)

aides pour la mobilité personnelle

aides au déplacement

14. Cannes ou béquilles
15. Canne blanche
16. Déambulateur
17. Fauteuil roulant manuel
18. Fauteuil roulant électrique
19. Tricycle (manuel ou à moteur)
20. Scooter adapté
21. Aide animale comme un chien guide
22. Autres aides pour marcher ou se déplacer

aides pour les transferts (aller du lit au fauteuil ou se tourner dans le lit)

23. Planches, sangles, harnais
24. Lève-personnes
25. Autres aides pour aller du lit au fauteuil

aides pour les traitements

26. Assistance respiratoire (respirateur, aspirateur, oxygénothérapie)
27. Traitement d'une affection circulatoire (bas anti-œdème, compression...)
28. Matériel de dialyse
29. Matériel d'injection (seringue ou aiguille, pompe à perfusion, pompe à insuline...)
30. Matériel pour faire des examens de contrôle (analyses de sang ou d'urines, tension artérielle...)
31. Stimulateur cardiaque (pacemaker)
32. Matériel anti-escarres (coussins, matelas...)
33. Autre aide pour les traitements
34. Aucune aide technique/prothèse

impairment

Module F - Restrictions d'activité

Filter : pour les enfants de moins de 5 ans=>passer au module G (page 92)

Préambule : Nous allons maintenant parler des difficultés que vous pouvez rencontrer dans les activités de la vie quotidienne et les aides éventuelles dont vous disposez pour les réaliser ainsi que celles dont vous auriez besoin. **Le mot aide se réfère à l'aide humaine, aux aides techniques et aux aménagements/adaptations du logement.** Une fois de plus, veuillez ignorer les problèmes passagers ou temporaires.

ADL. Avez-vous des difficultés pour réaliser seul(e) les activités suivantes ? (plusieurs réponses possibles)

Ne pas prendre en compte les cas où le parent répond que l'enfant est trop jeune (ex : se servir des toilettes seul pour un nourrisson) présenter la carte n°9

1. Vous laver seul(e) (prendre un bain, une douche)
2. Vous habiller et vous déshabiller seul(e)
3. Couper votre nourriture ou vous servir à boire seul(e)
4. Manger et boire seul(e), une fois que la nourriture est prête
5. Vous servir des toilettes seul(e)
6. Vous coucher et vous lever du lit seul(e)
7. Vous asseoir et vous lever d'un siège seul(e)
8. Aucune difficultés pour réaliser chacune de ces activités.

Filter : si age>=15 :

IADL. Avez-vous des difficultés pour réaliser seul(e) les activités suivantes ? (plusieurs réponses possibles)

Ne pas prendre en compte les cas où le parent répond que l'enfant est trop jeune (ex : faire les démarches administratives courantes) si la personne ne s'est jamais servie d'un ordinateur, il ne faut pas cocher la case 12 : Vous servir d'un ordinateur seul(e) car la question est sans objet. présenter la carte n°10

1. Faire vos courses seul(e)
2. Préparer vos repas seul(e)
3. Faire les tâches ménagères courantes dans votre domicile (vaisselle, lessive, repassage, rangement...) seul(e)
4. Faire les tâches plus occasionnelles seul(e) (petits travaux, laver les carreaux,...)
5. Faire les démarches administratives courantes seul(e)
6. Prendre vos médicaments seul(e)
7. Vous déplacer dans toutes les pièces d'un étage seul(e)
8. Sortir de votre logement seul(e)
9. Utiliser un moyen de déplacement seul(e) (prendre une voiture personnelle, commander un taxi, prendre les transports en commun)
10. Trouver seul(e) votre chemin lorsque vous sortez
11. Vous servir du téléphone seul(e)
12. Vous servir d'un ordinateur seul(e)
13. Aucune difficultés pour réaliser chacune de ces activités.

Module M - Loisirs

MSPORT. Au cours des douze derniers mois, avez-vous pratiqué une activité sportive [que ce soit dans le cadre ou non d'une association]? (inclure les randonnées et la marche sportive, la danse, etc.)

1. Oui
2. Non
9. Ne sait pas

filter : si Oui (si MSPORT=1) :

MSPORTFREQ. Etait-ce :

1. Régulièrement tout au long de l'année
2. De temps en temps tout au long de l'année
3. Seulement pendant certaines périodes ou les vacances
4. Occasionnellement ou rarement
9. Ne sait pas

MBRIJAR. Au cours des douze derniers mois, avez-vous fait du bricolage ou du jardinage ? (en dehors des petits travaux ou réparations)

1. Oui
2. Non
9. Ne sait pas

filter : si Oui (si MBRIJAR =1) :

MBRIJARFREQ. Etait-ce :

1. Régulièrement tout au long de l'année
2. De temps en temps tout au long de l'année
3. Seulement pendant certaines périodes ou les vacances
4. Occasionnellement ou rarement
9. Ne sait pas

MBRODCOUT. Au cours des douze derniers mois, avez-vous fait de la couture, du tricot ou de la broderie ? (en dehors du raccommodage ou des petits travaux)

1. Oui
2. Non
9. Ne sait pas

filter : si MBRODCOUT =1 (oui) :

MBRODCOUTFREQ. Etait-ce :

1. Régulièrement tout au long de l'année
2. De temps en temps tout au long de l'année
3. Seulement pendant certaines périodes ou les vacances
4. Occasionnellement ou rarement
9. Ne sait pas

MARTIS. Au cours des douze derniers mois, avez-vous pratiqué une activité artistique [que ce soit dans le cadre ou non d'une association]? (musique, peinture, théâtre, dessin, photo, etc.)

1. Oui
2. Non
9. Ne sait pas

filter : si MARTIS =1 (oui) :

MARTISFREQ. Etait-ce :

1. Régulièrement tout au long de l'année
2. De temps en temps tout au long de l'année
3. Seulement pendant certaines périodes ou les vacances
4. Occasionnellement ou rarement
9. Ne sait pas

Méthod: construct mRS

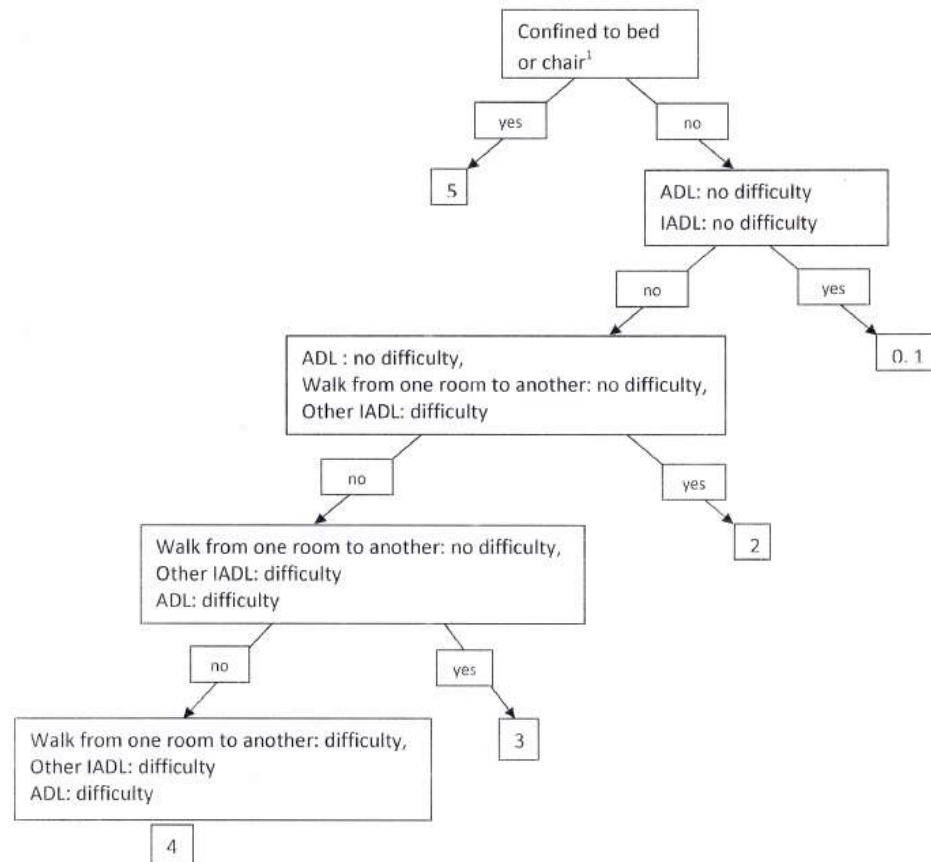
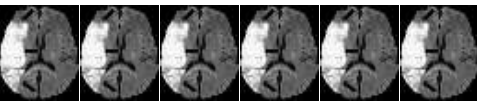


Fig.1. Scoring on the modified Rankin scale. ADL= activities of daily living (washing, dressing, feeding, using the toilet); IADL= instrumental activities of daily living (administrative procedures, managing medication, preparing a meal). ¹- Subjects who could not transfer independently in or out of a bed or a chair and who could not walk independently indoors.



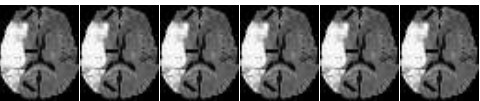
Résultat: demographic

Table 1. Prevalence of self-reported history of stroke in the French adult population.

| Prevalence whole population | Males | | Females | | p [§] | Together | | |
|-----------------------------|---------------------|------|---------------------|-----|----------------|---------------------|-----|----------|
| | Weighted prevalence | CI | Weighted prevalence | CI | | Weighted prevalence | CI | |
| All ages | 1725 | 1.7 | 1.4–1.9 | 1.5 | 1.3–1.7 | ns | 1.6 | 1.4–1.7 |
| ≥50 years | 1557 | 3.6 | 3.1–4.1 | 2.9 | 2.5–3.3 | * | 3.2 | 2.9–3.5 |
| 18–59 years | 392 | 0.5 | 0.4–0.6 | 0.4 | 0.3–0.5 | ns | 0.4 | 0.4–0.5 |
| 60–74 years | 422 | 3.4 | 2.5–4.3 | 2.4 | 1.7–3.1 | ns | 2.9 | 2.3–3.4 |
| 75–84 years | 518 | 8.2 | 6.3–10.0 | 4.7 | 3.6–5.9 | ** | 6.1 | 5.1–7.1 |
| ≥85 years | 393 | 10.9 | 6.6–15.2 | 8.9 | 7.1–10.8 | ns | 9.5 | 7.7–11.4 |

[§]: relationship between history of stroke and gender.

ns: not significant; *: $p < 0.05$; **: $p < 10^{-2}$ ***: $p < 10^{-3}$; CI= Confidence interval.



Résultats: autonomie pour les activités de vie quotidienne

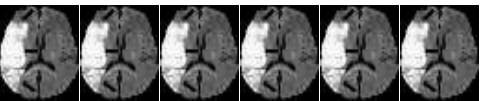
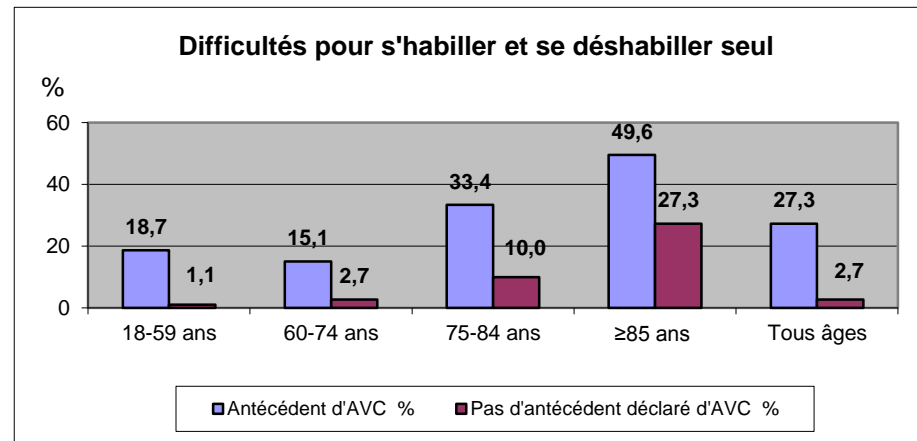
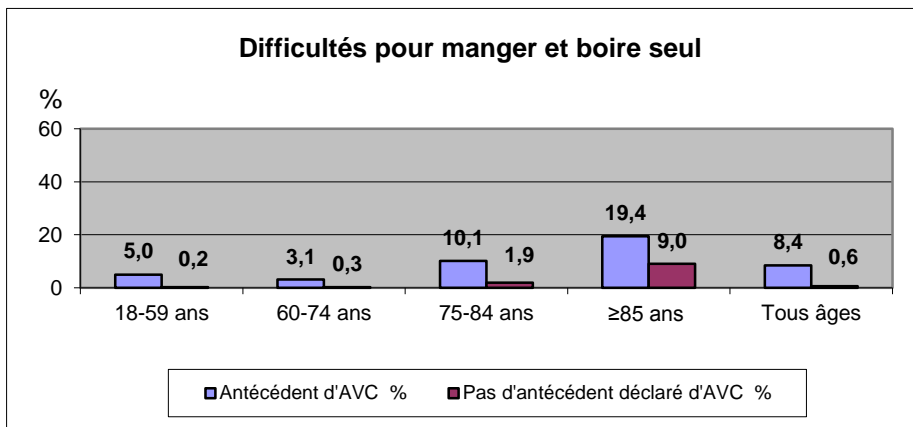
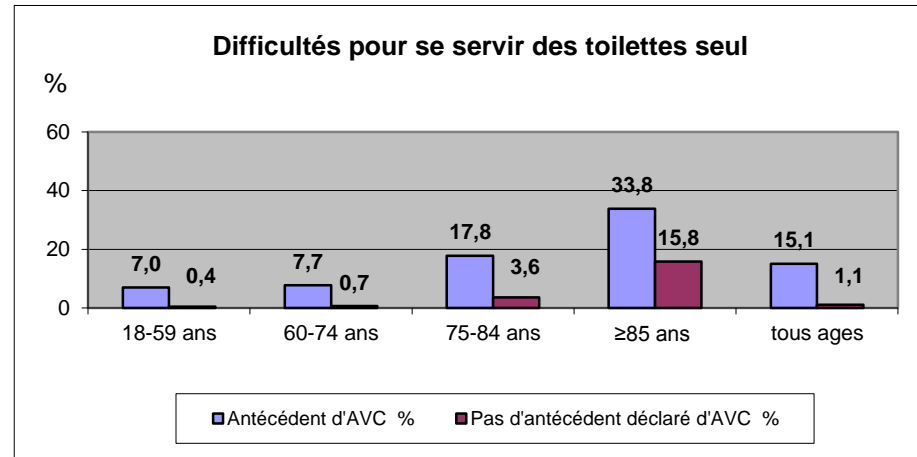
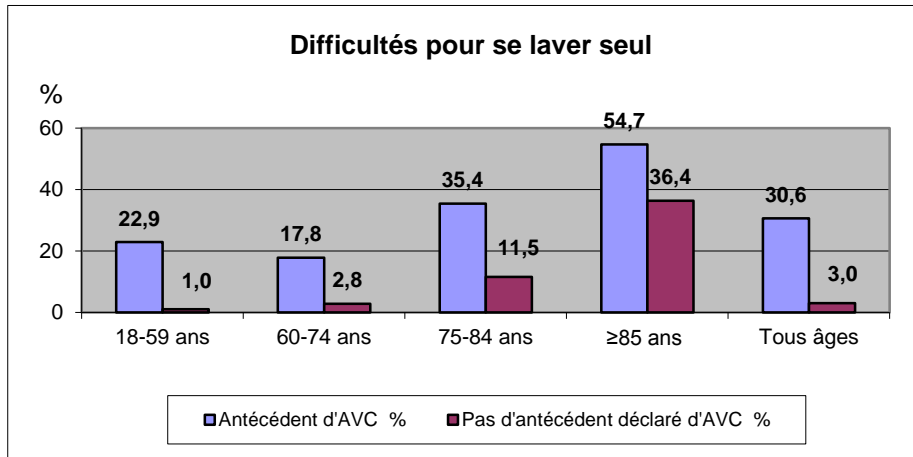


Table 3. Prevalence of self-reported ADI or iADL as a function of age and stroke history in France.

| | 18–59 years | | | 60–74 years | | | 75–84 years | | | 85 years and over | | | All ages ≥18ans | | |
|--|-------------|------|------|-------------|------|------|-------------|------|-----|-------------------|------|-----|-----------------|------|------|
| | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR |
| | % | % | | % | % | | % | % | | % | % | | % | % | |
| Overall limitation | | | | | | | | | | | | | | | |
| Not limited | 1.5 | 82.3 | 0.2 | 31.9 | 63.0 | 0.5 | 13.1 | 39.3 | 0.3 | 12.5 | 18.2 | 0.6 | 19.5 | 74.1 | 0.3 |
| Slightly limited | 38.6 | 11.8 | 3.3 | 21.6 | 24.5 | 0.9 | 23.7 | 32.6 | 0.7 | 20.1 | 32.1 | 0.6 | 25.4 | 16.1 | 1.6 |
| Severely limited | 45.9 | 5.9 | 7.8 | 46.4 | 12.5 | 3.7 | 63.2 | 28.1 | 2.2 | 67.4 | 49.7 | 1.3 | 55.0 | 9.8 | 5.6 |
| Difficulty to | | | | | | | | | | | | | | | |
| Wash independently | 22.9 | 1.0 | 22.9 | 17.8 | 2.8 | 6.3 | 35.4 | 11.5 | 3.1 | 54.7 | 36.4 | 1.5 | 30.6 | 3.0 | 10.2 |
| Dress and undress independently | 18.7 | 1.1 | 17 | 15.1 | 2.7 | 5.6 | 33.4 | 10.0 | 3.3 | 49.6 | 27.3 | 1.8 | 27.3 | 2.7 | 10.1 |
| Eat and drink independently | 5.0 | 0.2 | 25 | 3.1 | 0.3 | 10.3 | 10.1 | 1.9 | 5.3 | 19.4 | 9.0 | 2.2 | 8.4 | 0.6 | 14 |
| Use the toilet independently | 7.0 | 0.4 | 17.5 | 7.7 | 0.7 | 11 | 17.8 | 3.6 | 4.9 | 33.8 | 15.8 | 1.1 | 15.1 | 1.1 | 13.7 |
| Prepare meals independently | 23.9 | 1.0 | 23.9 | 20.7 | 2.7 | 7.7 | 37.3 | 10.9 | 3.4 | 47.6 | 32.5 | 1.4 | 31.0 | 2.9 | 10.7 |
| Carry out administrative processes independently | 28.3 | 2.5 | 11.3 | 26.7 | 5.6 | 4.7 | 46.9 | 20.5 | 2.3 | 69.8 | 52.8 | 1.3 | 40.6 | 5.7 | 7.1 |
| Take medication independently | 9.9 | 0.6 | 16.5 | 13.5 | 1.2 | 11.3 | 30.5 | 6.7 | 4.6 | 44.4 | 24.4 | 1.8 | 23.3 | 1.8 | 12.9 |
| Walk from one room to another independently | 6.8 | 0.3 | 22.7 | 8.3 | 0.8 | 10.4 | 17.6 | 4.4 | 4 | 33.6 | 18.0 | 1.9 | 15.2 | 1.2 | 12.7 |

S+=self-reported stroke, S=no self-reported stroke, RR= relative risk.

doi:10.1371/journal.pone.0115375.t003

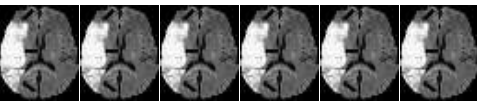


Table 3. Prevalence of self-reported ADI or iADL as a function of age and stroke history in France.

| | 18–59 years | | | 60–74 years | | | 75–84 years | | | 85 years and over | | | All ages ≥18ans | | |
|--|-------------|------|------|-------------|------|------|-------------|------|-----|-------------------|------|-----|-----------------|------|------|
| | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR |
| | % | % | | % | % | | % | % | | % | % | | % | % | |
| Overall limitation | | | | | | | | | | | | | | | |
| Not limited | 1.5 | 82.3 | 0.2 | 31.9 | 63.0 | 0.5 | 13.1 | 39.3 | 0.3 | 12.5 | 18.2 | 0.6 | 19.5 | 74.1 | 0.3 |
| Slightly limited | 38.6 | 11.8 | 3.3 | 21.6 | 24.5 | 0.9 | 23.7 | 32.6 | 0.7 | 20.1 | 32.1 | 0.6 | 25.4 | 16.1 | 1.6 |
| Severely limited | 45.9 | 5.9 | 7.8 | 46.4 | 12.5 | 3.7 | 63.2 | 28.1 | 2.2 | 67.4 | 49.7 | 1.3 | 55.0 | 9.8 | 5.6 |
| Difficulty to | | | | | | | | | | | | | | | |
| Wash independently | 22.9 | 1.0 | 22.9 | 17.8 | 2.8 | 6.3 | 35.4 | 11.5 | 3.1 | 54.7 | 36.4 | 1.5 | 30.6 | 3.0 | 10.2 |
| Dress and undress independently | 18.7 | 1.1 | 17 | 15.1 | 2.7 | 5.6 | 33.4 | 10.0 | 3.3 | 49.6 | 27.3 | 1.8 | 27.3 | 2.7 | 10.1 |
| Eat and drink independently | 5.0 | 0.2 | 25 | 3.1 | 0.3 | 10.3 | 10.1 | 1.9 | 5.3 | 19.4 | 9.0 | 2.2 | 8.4 | 0.6 | 14 |
| Use the toilet independently | 7.0 | 0.4 | 17.5 | 7.7 | 0.7 | 11 | 17.8 | 3.6 | 4.9 | 33.8 | 15.8 | 1.1 | 15.1 | 1.1 | 13.7 |
| Prepare meals independently | 23.9 | 1.0 | 23.9 | 20.7 | 2.7 | 7.7 | 37.3 | 10.9 | 3.4 | 47.6 | 32.5 | 1.4 | 31.0 | 2.9 | 10.7 |
| Carry out administrative processes independently | 28.3 | 2.5 | 11.3 | 26.7 | 5.6 | 4.7 | 46.9 | 20.5 | 2.3 | 69.8 | 52.8 | 1.3 | 40.6 | 5.7 | 7.1 |
| Take medication independently | 9.9 | 0.6 | 16.5 | 13.5 | 1.2 | 11.3 | 30.5 | 6.7 | 4.6 | 44.4 | 24.4 | 1.8 | 23.3 | 1.8 | 12.9 |
| Walk from one room to another independently | 6.8 | 0.3 | 22.7 | 8.3 | 0.8 | 10.4 | 17.6 | 4.4 | 4 | 33.6 | 18.0 | 1.9 | 15.2 | 1.2 | 12.7 |

S+=self-reported stroke, S=no self-reported stroke, RR= relative risk.

doi:10.1371/journal.pone.0115375.t003

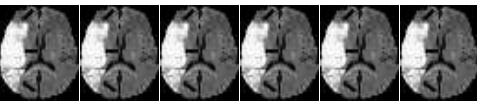
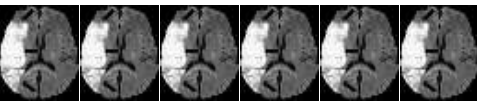


Table 3. Prevalence of self-reported ADI or iADL as a function of age and stroke history in France.

| | 18–59 years | | | 60–74 years | | | 75–84 years | | | 85 years and over | | | All ages ≥18ans | | |
|--|-------------|------|------|-------------|------|------|-------------|------|-----|-------------------|------|-----|-----------------|------|------|
| | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR | S+ | S- | RR |
| | % | % | | % | % | | % | % | | % | % | | % | % | |
| Overall limitation | | | | | | | | | | | | | | | |
| Not limited | 1.5 | 82.3 | 0.2 | 31.9 | 63.0 | 0.5 | 13.1 | 39.3 | 0.3 | 12.5 | 18.2 | 0.6 | 19.5 | 74.1 | 0.3 |
| Slightly limited | 38.6 | 11.8 | 3.3 | 21.6 | 24.5 | 0.9 | 23.7 | 32.6 | 0.7 | 20.1 | 32.1 | 0.6 | 25.4 | 16.1 | 1.6 |
| Severely limited | 45.9 | 5.9 | 7.8 | 46.4 | 12.5 | 3.7 | 63.2 | 28.1 | 2.2 | 67.4 | 49.7 | 1.3 | 55.0 | 9.8 | 5.6 |
| Difficulty to | | | | | | | | | | | | | | | |
| Wash independently | 22.9 | 1.0 | 22.9 | 17.8 | 2.8 | 6.3 | 35.4 | 11.5 | 3.1 | 54.7 | 36.4 | 1.5 | 30.6 | 3.0 | 10.2 |
| Dress and undress independently | 18.7 | 1.1 | 17 | 15.1 | 2.7 | 5.6 | 33.4 | 10.0 | 3.3 | 49.6 | 27.3 | 1.8 | 27.3 | 2.7 | 10.1 |
| Eat and drink independently | 5.0 | 0.2 | 25 | 3.1 | 0.3 | 10.3 | 10.1 | 1.9 | 5.3 | 19.4 | 9.0 | 2.2 | 8.4 | 0.6 | 14 |
| Use the toilet independently | 7.0 | 0.4 | 17.5 | 7.7 | 0.7 | 11 | 17.8 | 3.6 | 4.9 | 33.8 | 15.8 | 1.1 | 15.1 | 1.1 | 13.7 |
| Prepare meals independently | 23.9 | 1.0 | 23.9 | 20.7 | 2.7 | 7.7 | 37.3 | 10.9 | 3.4 | 47.6 | 32.5 | 1.4 | 31.0 | 2.9 | 10.7 |
| Carry out administrative processes independently | 28.3 | 2.5 | 11.3 | 26.7 | 5.6 | 4.7 | 46.9 | 20.5 | 2.3 | 69.8 | 52.8 | 1.3 | 40.6 | 5.7 | 7.1 |
| Take medication independently | 9.9 | 0.6 | 16.5 | 13.5 | 1.2 | 11.3 | 30.5 | 6.7 | 4.6 | 44.4 | 24.4 | 1.8 | 23.3 | 1.8 | 12.9 |
| Walk from one room to another independently | 6.8 | 0.3 | 22.7 | 8.3 | 0.8 | 10.4 | 17.6 | 4.4 | 4 | 33.6 | 18.0 | 1.9 | 15.2 | 1.2 | 12.7 |

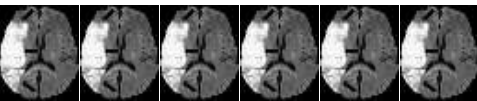
S+=self-reported stroke, S=no self-reported stroke, RR= relative risk.

doi:10.1371/journal.pone.0115375.t003



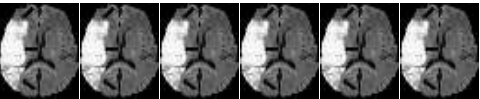
| Estimated Rankin score | 18-59 | | 60-74 | | 75-84 | | 85 years and over | | Total | |
|-------------------------------------|-------|------|-------|------|-------|------|-------------------|------|-------|------|
| | S+ | S- | S+ | S- | S+ | S- | S+ | S- | S+ | S- |
| | % | | | | | | | | | |
| Whole population | | | | | | | | | | |
| 0-1 | 60.3 | 96.6 | 67.8 | 92.0 | 42.0 | 73.4 | 21.3 | 38.7 | 50.4 | 92.6 |
| 2 | 15.3 | 2.0 | 11.7 | 4.1 | 16.9 | 12.2 | 19.0 | 19.5 | 15.3 | 3.6 |
| 3 | 17.6 | 1.1 | 12.3 | 3.1 | 23.4 | 10.1 | 25.9 | 23.9 | 19.1 | 2.7 |
| 4-5 | 6.8 | 0.3 | 8.3 | 0.8 | 17.7 | 4.4 | 33.8 | 18.0 | 15.3 | 1.2 |
| Participants living at home | | | | | | | | | | |
| 0-1 | 61.3 | 96.9 | 70.3 | 92.6 | 46.5 | 75.8 | 28.0 | 46.4 | 55.3 | 93.5 |
| 2 | 15.1 | 1.9 | 11.6 | 3.9 | 18.1 | 12.1 | 23.8 | 21.5 | 16.0 | 3.4 |
| 3 | 17.5 | 1 | 11.7 | 2.9 | 23.5 | 9.4 | 29.3 | 23.5 | 19.0 | 2.4 |
| 4-5 | 6.0 | 0.2 | 6.4 | 0.6 | 12.0 | 2.7 | 18.9 | 8.6 | 9.7 | 0.7 |
| Participants living in institutions | | | | | | | | | | |
| 0-1 | 10.0 | 19.2 | 3.1 | 13.4 | 5.1 | 9.2 | 3.4 | 6.8 | 4.2 | 10.8 |
| 2 | 24.3 | 32.7 | 12.1 | 23.2 | 7.2 | 13.6 | 6.1 | 10.8 | 8.0 | 17.6 |
| 3 | 22.2 | 19.6 | 28.8 | 29.5 | 22.6 | 26.0 | 16.8 | 25.7 | 20.5 | 24.9 |
| 4-5 | 43.5 | 28.4 | 56.0 | 33.9 | 65.1 | 51.3 | 73.7 | 56.8 | 67.3 | 46.7 |

S+=self-reported stroke, S-=no self-reported stroke.



Conclusion

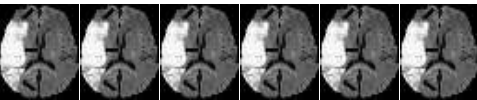
- These results demonstrate a high national prevalence of stroke.
- Older people are highly dependent, irrespective of stroke history
- The relative risk of dependence in young subjects with a history of stroke is high compared with those without.



Prevalence and functional impact of self-reported joint stiffness after stroke: results of a French national 'Disability Health' survey.

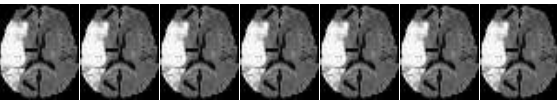
Alexis Schnitzler (MD)¹, Francois Genet (MD, PhD)¹, Claire Jourdan (Md, PhD)¹, Loic Josseran (MD, PhD)², Philippe Azouvi (MD PhD)¹

[Schnitzler A et al. Prevalence and functional impact of self-reported joint stiffness after stroke: results of a French national 'Disability Health' survey. Under submission...](#)



Introduction

- The prevalence of joint stiffness following stroke is not very well known (17 to 46%).
- Post-stroke spasticity is considered to be an important contributing factor to disability.
- The majority of the studies were single-center with small samples and based on univariate analyses (despite the fact that there are many confounding criteria).



Results

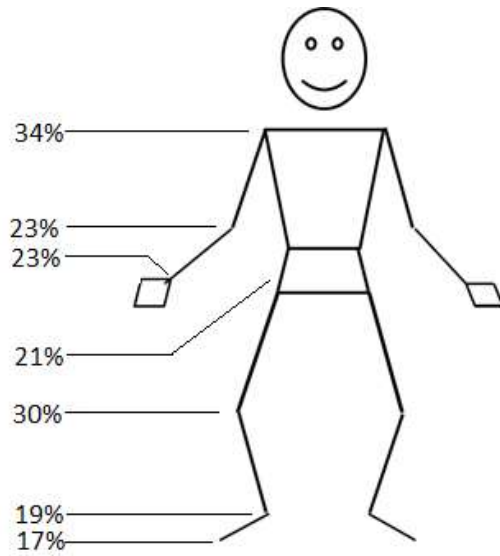
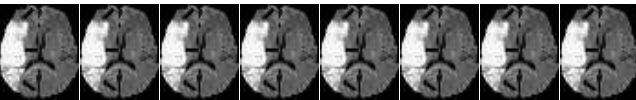
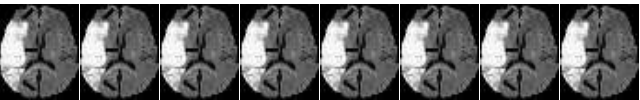


Figure 1: Frequency of affected joints in people with history of stroke-related stiffness

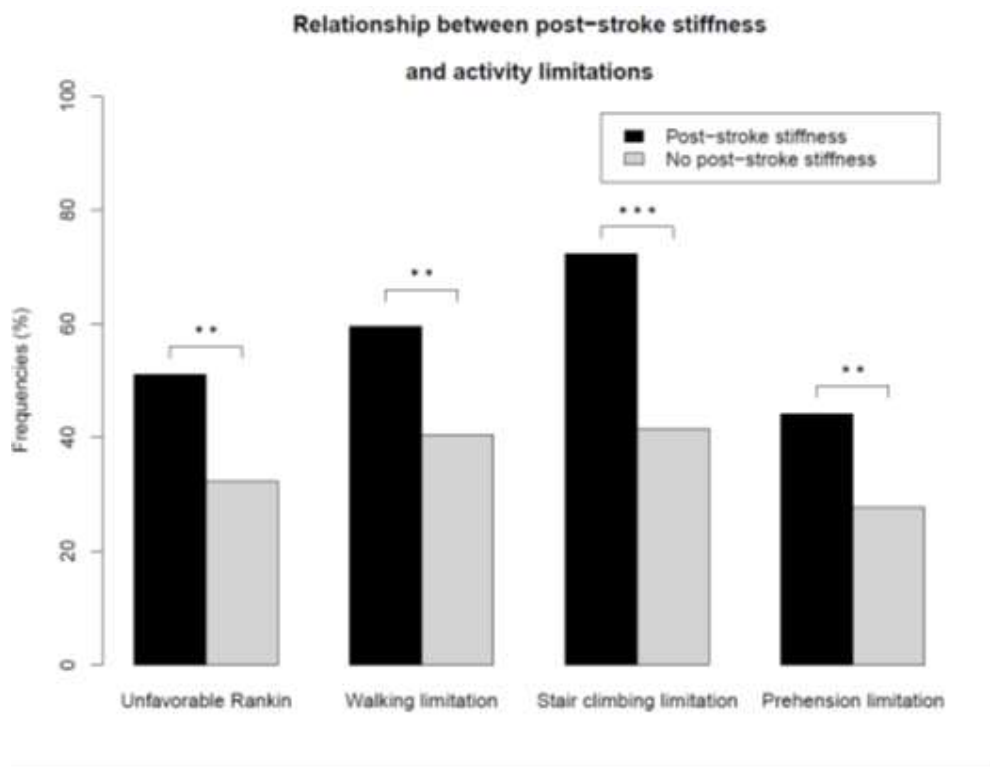


Results

- Of the 764 719 persons (SD=36 646) (adjusted data) who reported a history of stroke, 10.3% reported stroke-related stiffness.
- Participants who reported stiffness more frequently had a high Modified Rankin Score (above 2) (OR=2.18, CI 1.29-3.67), and were more frequently impaired with regard to climbing stairs, walking and grasping objects ($p<0.01$ for each).



Résultats



mRS supérieur à 2

step 1 (univariate analysis)

step 2 (multivariate analysis)

step 3 (multivariate analysis)

Post stroke stiffness

2,18 (CI=1,30-3,67)

OR= 2,18 (CI=1,15-4,11)

OR= 1,18 (CI = 0,60-2,29), NS

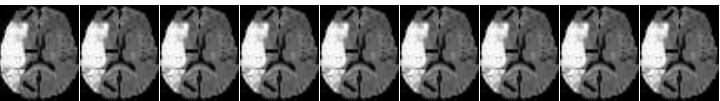
Age

OR=1,80 (CI=1,49-2,18)

OR= 2.02 (CI = 1,62-2,51)

Motor impairment

OR=3,96 (CI= 3,15-4,98)



Results

Table 2: Distribution of consultations for participants who reported a history of stroke

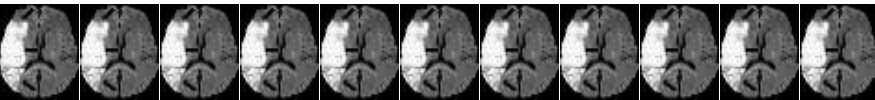
| Medical or paramedical professionals | Frequency of professionals consulted in 12 months (SD) |
|--------------------------------------|--|
| PMR | 0.3% (+/-0.2) |
| Neurologist | 19.1% (+/-1.9) |
| Rheumatologist | 9.6% (+/-9.6) |
| Specialist Physician | 25.9% (+/-2.1) |
| General Physician | 98.6% (+/-0.5) |
| Physiotherapist | 38.8% (+/-2.1) |
| Occupational therapist | 3.4% (+/-0.5) |
| Nurse | 41.1% (+/-2.0) |

PMR = Physical and Rehabilitation Medicine specialist, SD = standard deviation

EFFECT OF REHABILITATION SETTING ON DEPENDENCE FOLLOWING STROKE: AN ANALYSIS OF THE FRENCH INPATIENT DATABASE

Schnitzler A, Woimant F, Nicolau J, Tuppin P, de Peretti C.

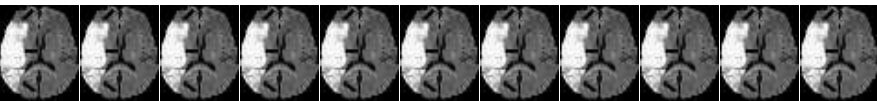
Schnitzler A et al. Effect of rehabilitation setting on dependence following stroke: an analysis of the French inpatient database. *Neurorehabil Neural Repair*. 2014 Jan;28(1):36-44.



Effet de l'organisation des soins (rééducation spécialisée vs. polyvalente)

- 9 RCT, 1437 patients
- In post-acute phase, many studies and meta-analyses have demonstrated the effectiveness of specific, multidisciplinary rehabilitation

Langhorne & Duncan, Stroke, 2001;32:268-274



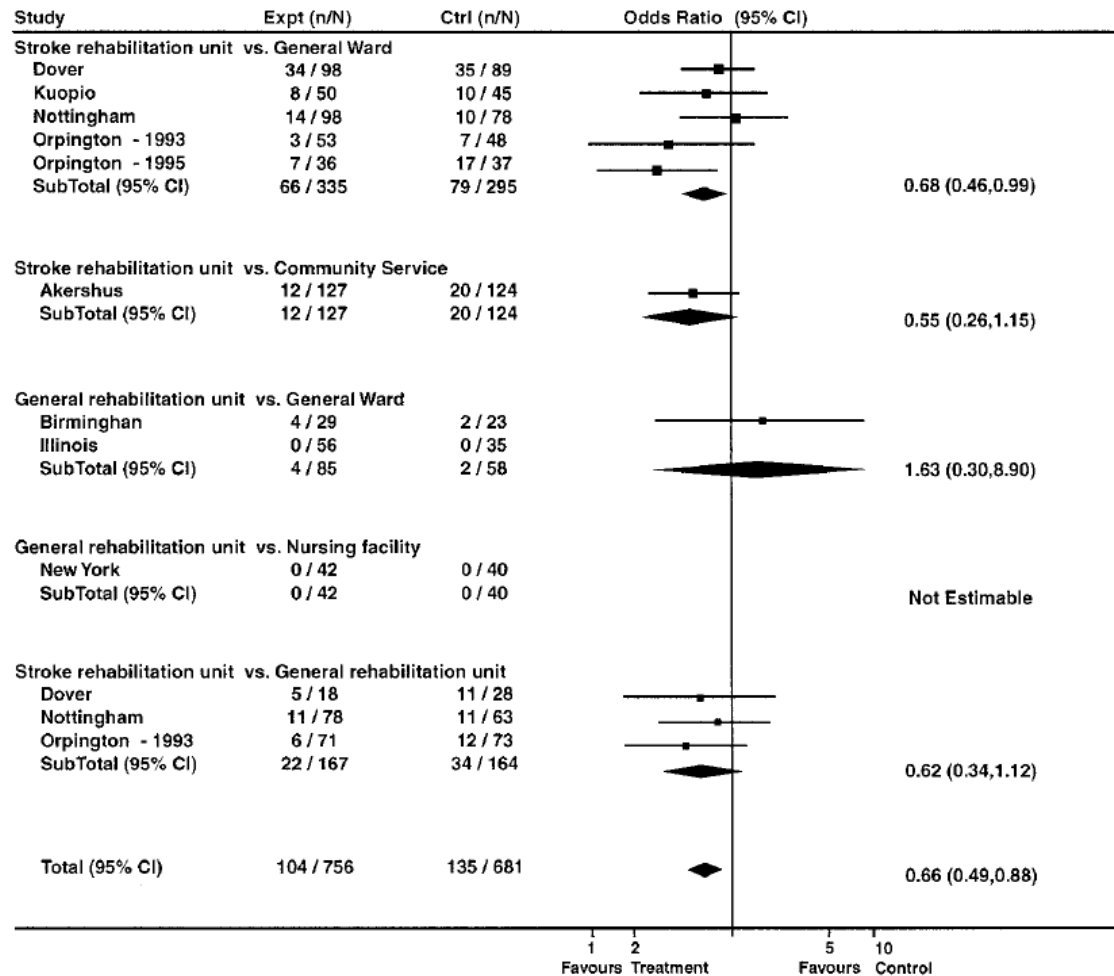
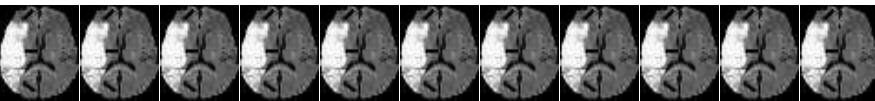


Figure 1. Organized inpatient multidisciplinary rehabilitation vs alternative care: **dead at the end of scheduled follow-up**. Data are presented as the proportion (n/N) of patients in the organized inpatient rehabilitation (Expt) or alternative service group (Ctrl) who died by the end of scheduled follow-up (median, 1 year) together with the odds ratio and 95% CI. Results are stratified by trial and trial sub-group (see Results).



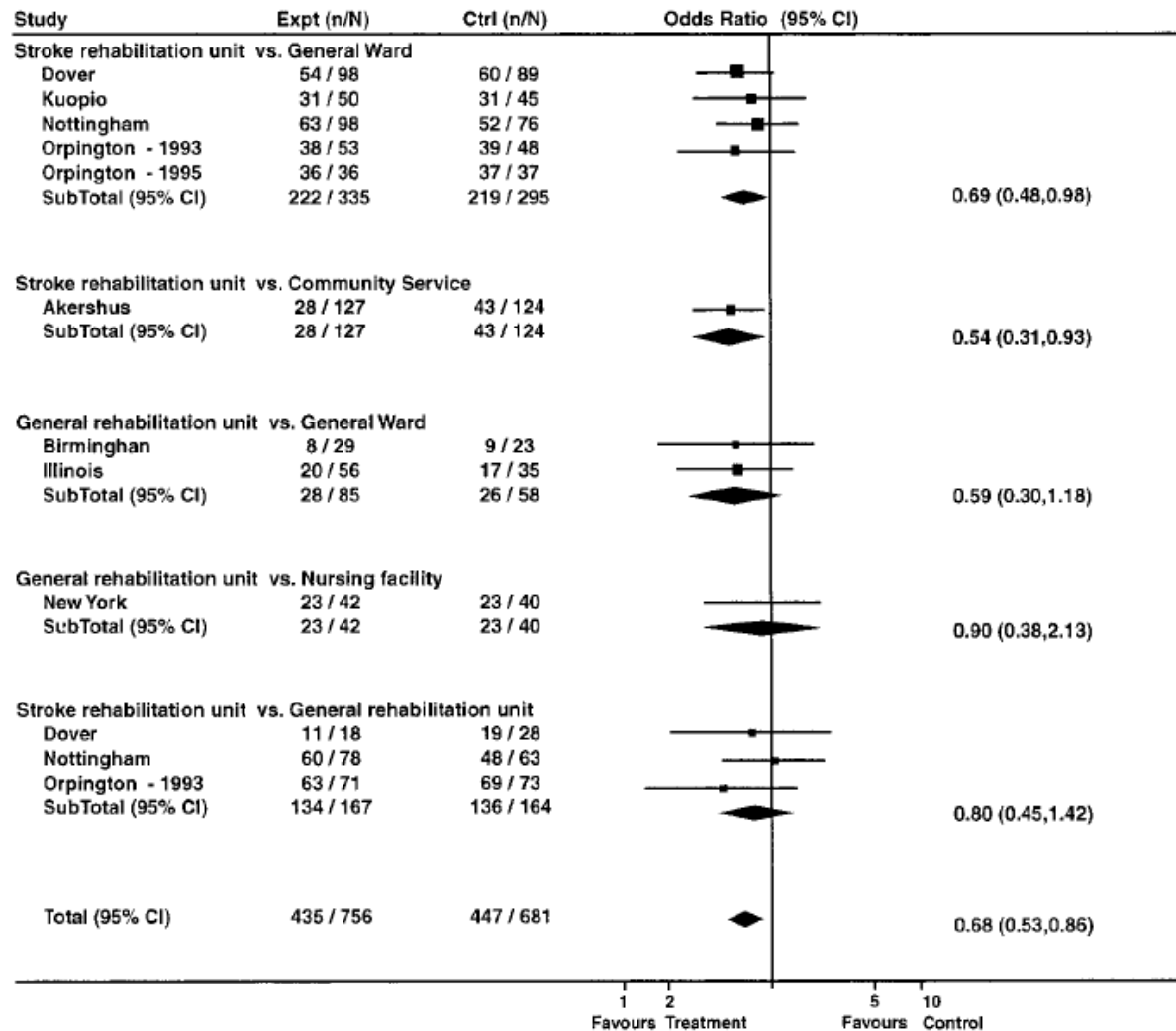
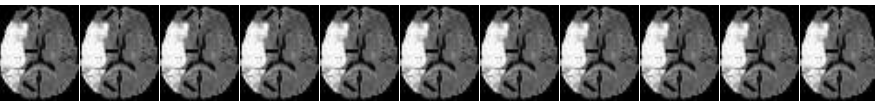


Figure 2. Organized inpatient multidisciplinary rehabilitation vs alternative care: **dead or dependent at the end of scheduled follow-up**. Data are presented as the proportion (n/N) of patients in the organized inpatient rehabilitation (Expt) or alternative service group (Ctrl) who died or were judged to be dependent at the end of scheduled follow-up (median, 1 year) together with the odds ratio and 95% CI. Results are stratified by trial and trial subgroup (see Results).



Introduction

- In France in 2009, patients admitted to Multidisciplinary Inpatient Rehabilitation for stroke were sent to a neurological rehabilitation center (NRC) or a general or geriatric rehabilitation (GRC) service.
- Objective: To describe the functional outcome of stroke patients admitted for rehabilitation in France in 2009, both globally and as a function of the rehabilitation setting (GRC or NRC).

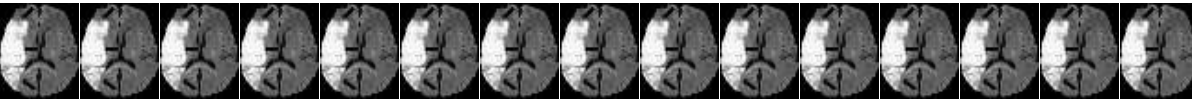


Figure 1a. Proportions régionales de patients hospitalisés en soins de suite et de réadaptation après un AVC, France, 2007 / *Figure 1a. Regional post-acute hospitalization rates after a stroke, France, 2007*

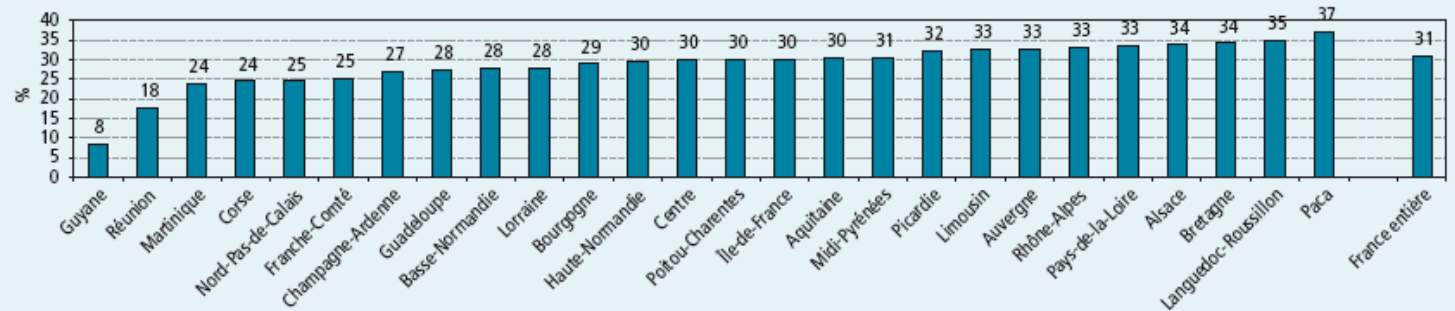
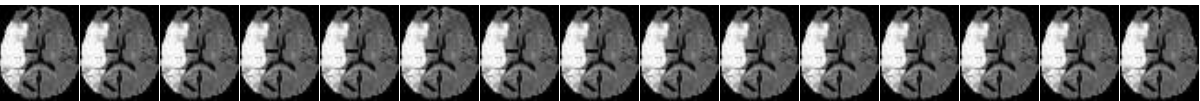
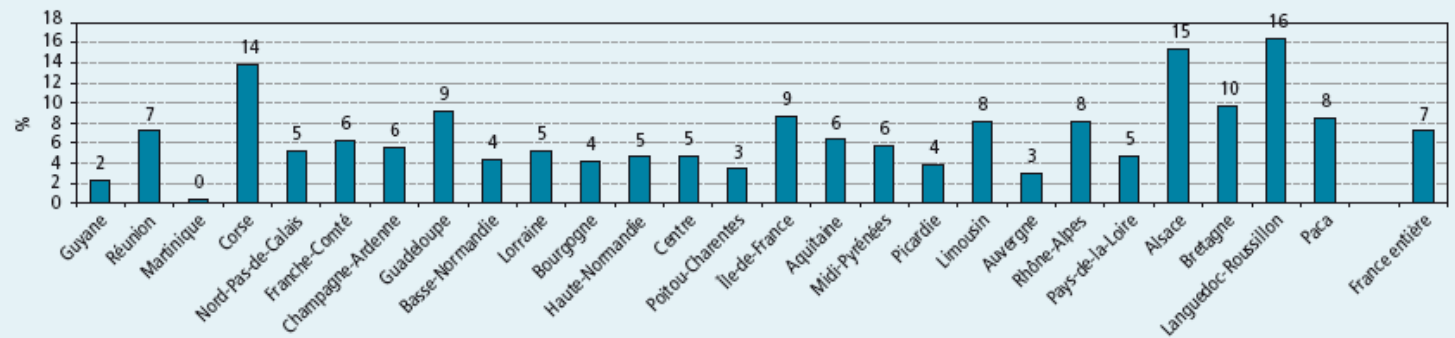
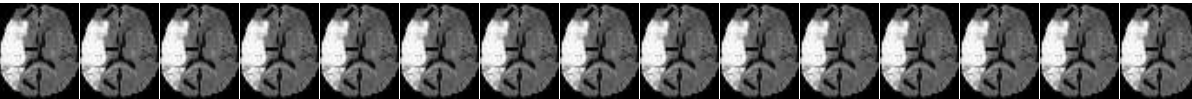


Figure 1b. Proportions régionales de patients hospitalisés en rééducation fonctionnelle après un AVC, France, 2007 / *Figure 1b. Regional rates of hospitalization in rehabilitation facilities after a stroke, France, 2007*



Méthods

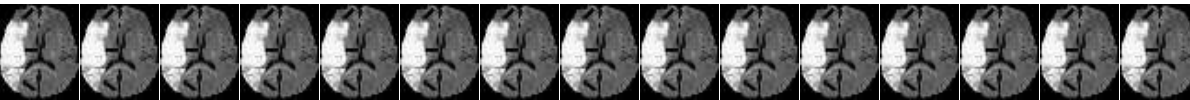
- Data from the French Hospital Discharge Diagnosis databases (PMSI) for 2009 were included (I60 to I64) .
- Two logistic regression models were used to analyze factors related to improvement in dependence score and discharge home. Odds ratios (OR) were also calculated.



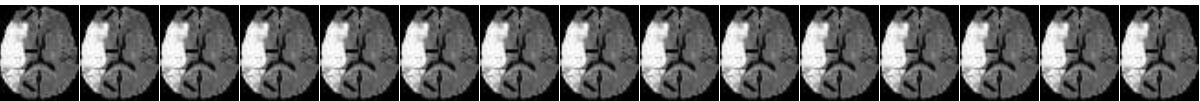
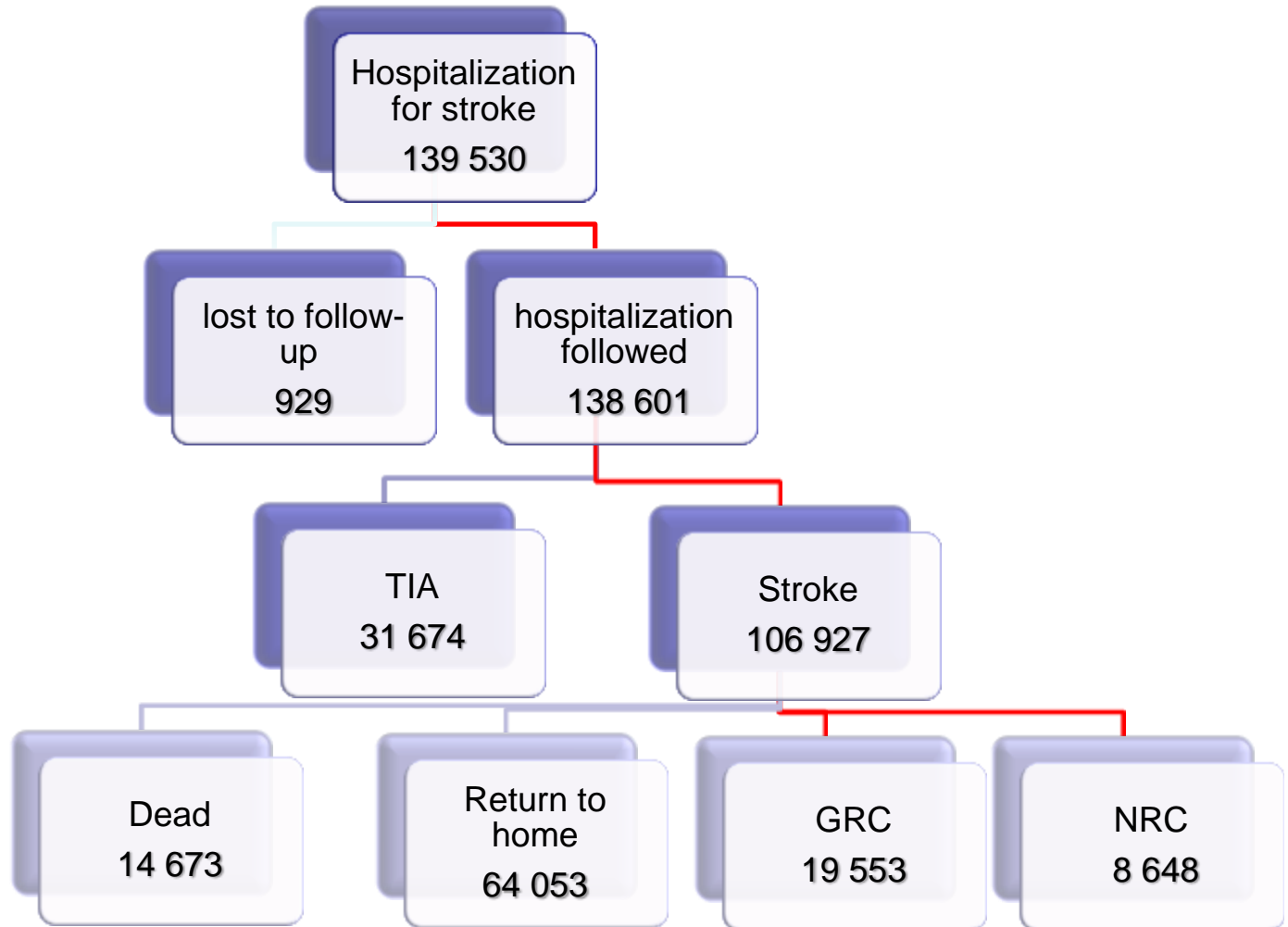
Méthode

- Comorbidities assessed by the Charlson index
- Evolution of autonomy and patient outcomes identified in first half 2009

Quan H, et al. Med Care. 2005

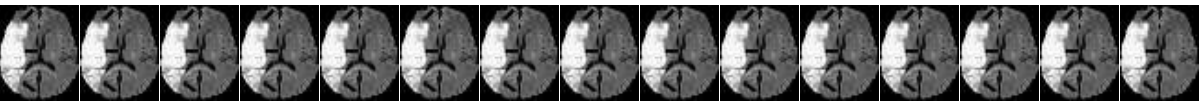


RESULTS



| | GRC† | NRC† | p | MIR |
|--|--------|-------|--------------------|--------|
| Number of patients admitted to MIR | 19 553 | 8 648 | | 28 201 |
| Total % | 23.4 | 10.4 | | 33.8 |
| Sex | | | p<10 ⁻⁴ | |
| Males % | 19.1 | 11.7 | | 30.8 |
| Females % | 27.8 | 9.0 | | 36.8 |
| Age | | | p<10 ⁻⁴ | |
| < 60 years % | 9.0 | 15.7 | | 24.7 |
| 60 - 74 years % | 16.4 | 14.3 | | 30.6 |
| ≥ 75 years % | 32.0 | 6.6 | | 38.6 |
| Mean age | 78.6 | 66.4 | p<10 ⁻⁴ | 74.8 |
| Median age | 81 | 69 | p<10 ⁻⁴ | 78 |
| Median cumulated length of stay in MIR (days) | 40 | 63 | p<10 ⁻⁴ | 46 |
| Cumulated length of stay > 90 days (%) | 17.4 | 35.5 | p<10 ⁻⁴ | 22.9 |
| Physical score | | | | |
| Ambulation | 69.6 | 66.6 | p<10 ⁻⁴ | 68.7 |
| Feeding | 45.1 | 41.5 | p<10 ⁻⁴ | 44.0 |
| Dressing | 74.2 | 69.4 | p<10 ⁻⁴ | 72.7 |
| Continence | 62.5 | 53.4 | p<10 ⁻⁴ | 59.7 |
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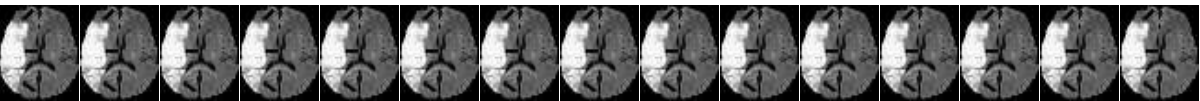
Table 1. Stroke survivors admitted to Multidisciplinary Inpatient Rehabilitation
GRC: general or geriatric rehabilitation centre, NRC: neurological rehabilitation centre, MIR multidisciplinary inpatient rehabilitation



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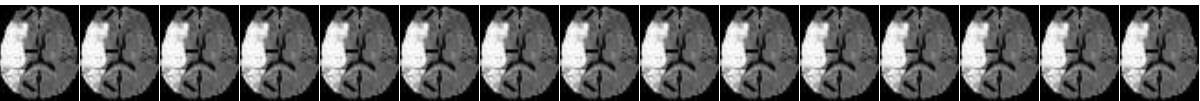
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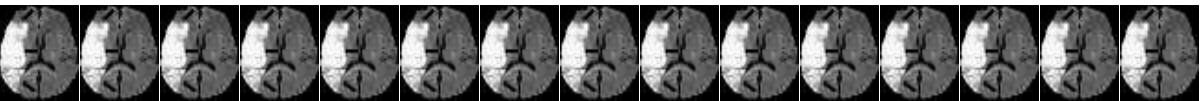
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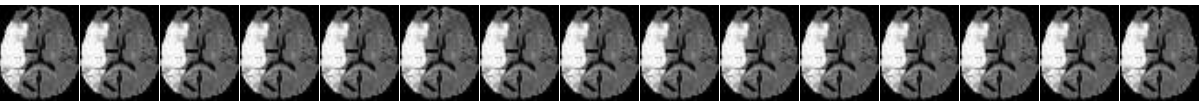
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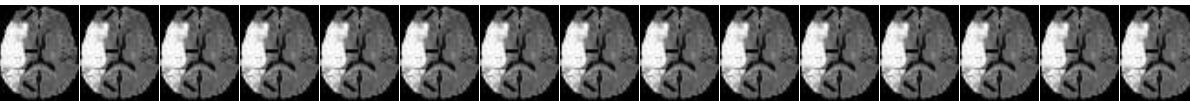
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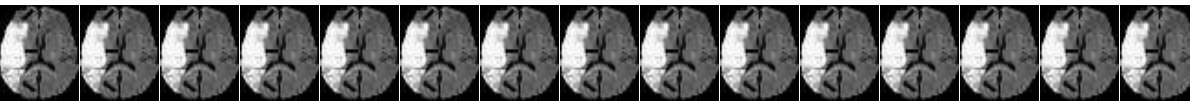
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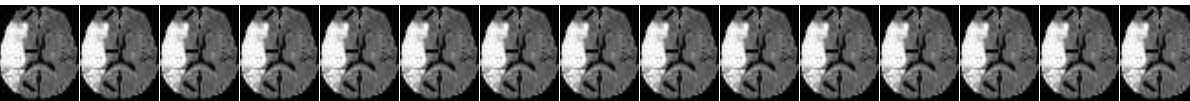
| Physical dependence score ≥ 12 on admission to MIR† (%) | GRC† | NRC† | p | MIR |
|--|-------------|-------------|---------------|------------|
| < 60 years | 34.7 | 39.3 | 0.004 | 37.6 |
| 60 - 74 years | 49.6 | 50.9 | 0.299 | 50.2 |
| ≥ 75 years | 60.0 | 58.4 | 0.11 | 59.7 |
| All ages | 56.2 | 50.0 | $p < 10^{-4}$ | 54.3 |



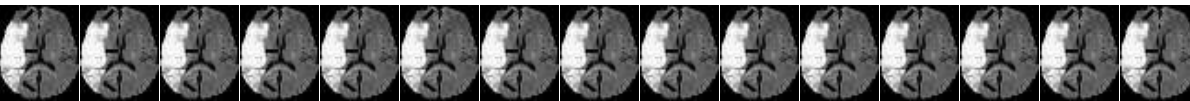
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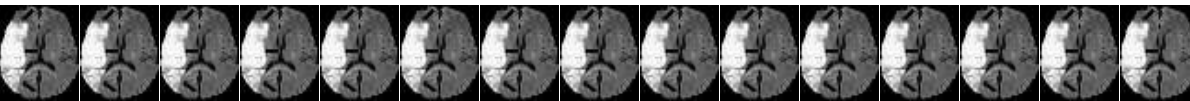


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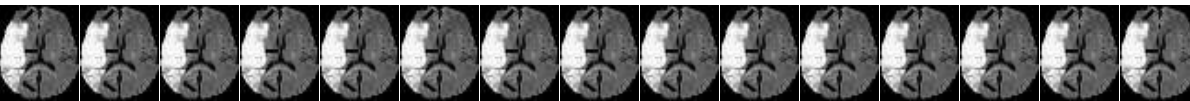
| Improvement in global physical dependence | | OR | CI 95% | | p |
|---|------------------------|------|--------|------|--------------------|
| Sex | Males (reference) | 1.00 | | | 0.031 |
| | Females | 0.92 | 0.85 - | 0.99 | |
| Age | < 60 years | 2.59 | 2.28 - | 2.95 | p<10 ⁻⁴ |
| | 60 - 74 years | 1.85 | 1.68 - | 2.04 | |
| | ≥ 75 years (reference) | 1.00 | | | |
| Type of MIR | NRC | 1.90 | 1.73 - | 2.07 | p<10 ⁻⁴ |
| | GRC (reference) | 1.00 | | | |
| Number of stroke patients admitted yearly | < 50 (reference) | 1.00 | | | p=0.043 |
| | 50 - 99 | 1.11 | 1.01 - | 1.21 | |
| | 100 - 499 | 1.16 | 1.02 - | 1.32 | |
| | ≥ 500 | 1.02 | 0.85 - | 1.24 | |
| Comorbidities (Charlson's index) | 0 (reference) | 1.00 | | | p<10 ⁻⁴ |
| | 1 - 4 | 0.89 | 0.82 - | 0.96 | |
| | ≥ 5 | 0.64 | 0.52 - | 0.79 | |

Table 2. Factors associated with an improvement in physical dependency score during MIR
GRC: general or geriatric rehabilitation centre, NRC: neurological rehabilitation centre, MIR multidisciplinary inpatient rehabilitation



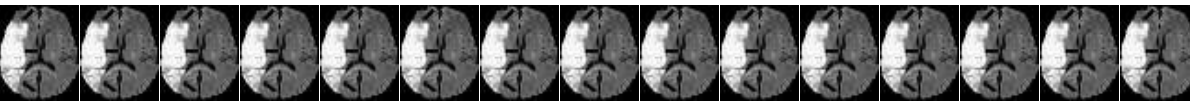
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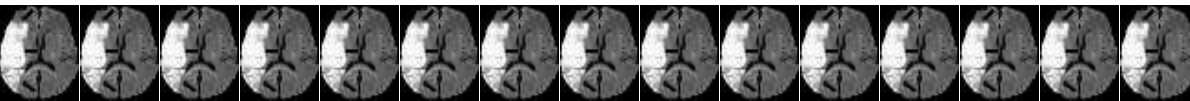
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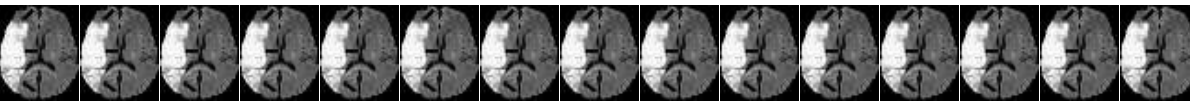
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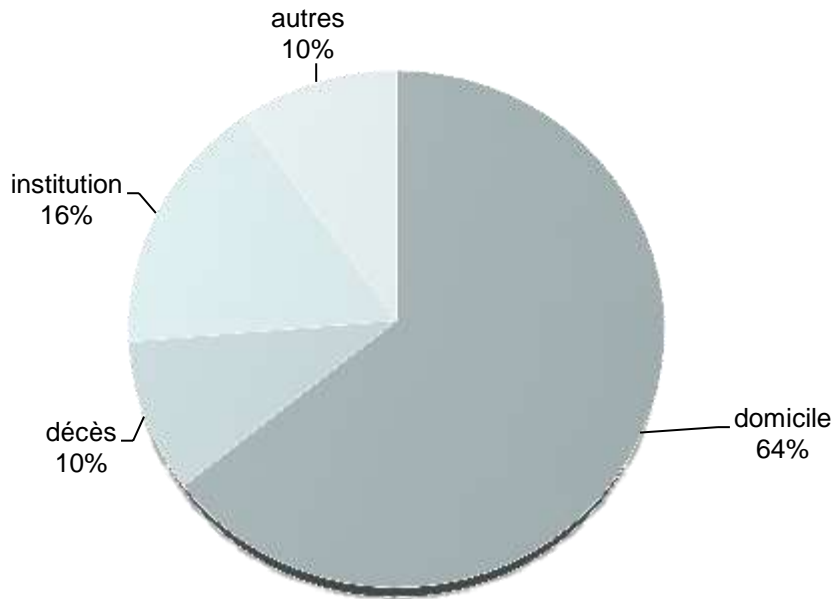


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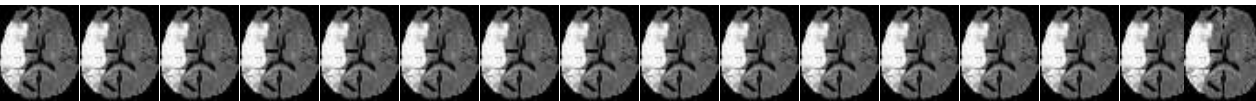
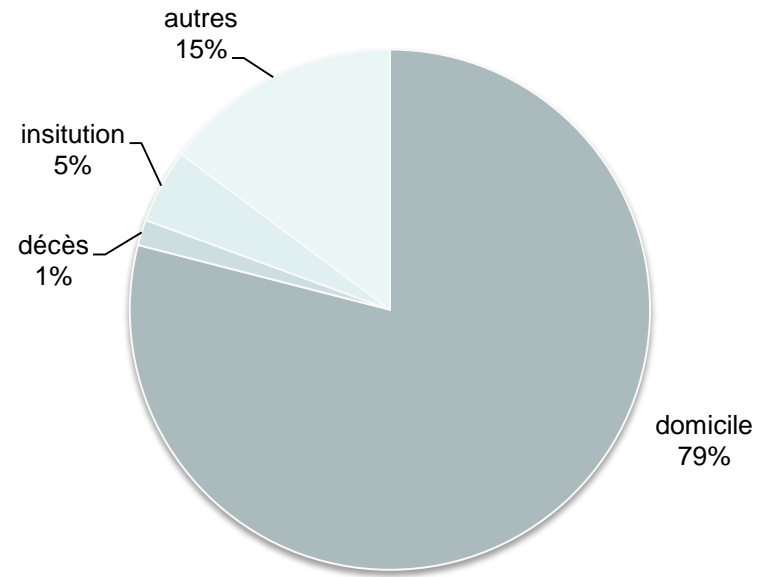
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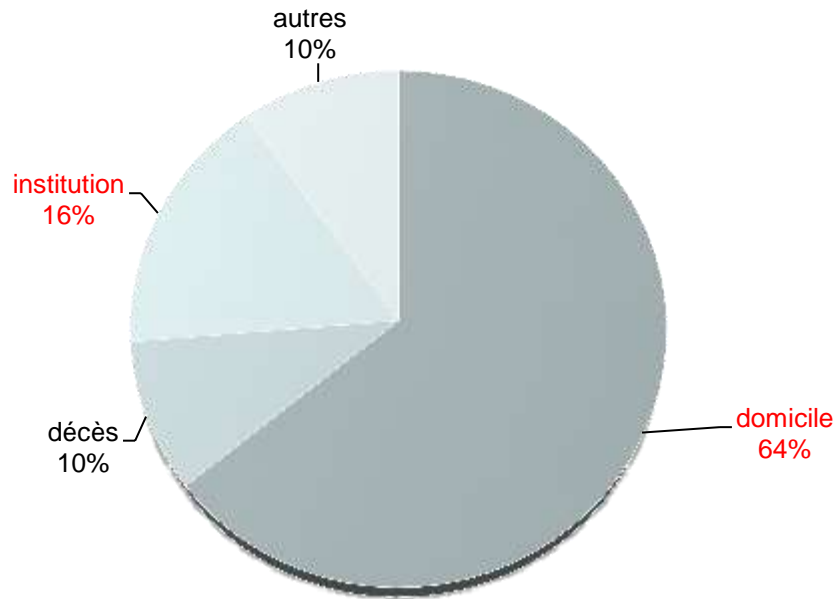
outcome after GRC



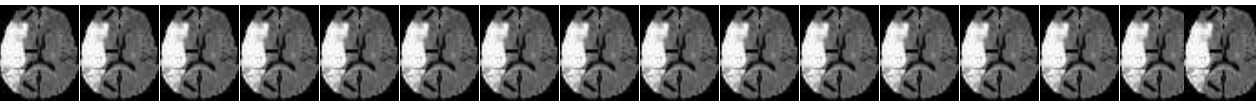
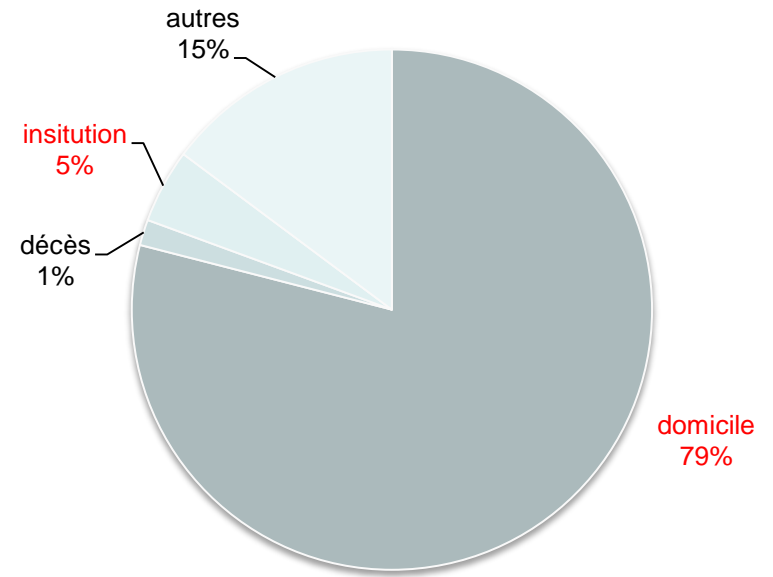
Outcome after NRC



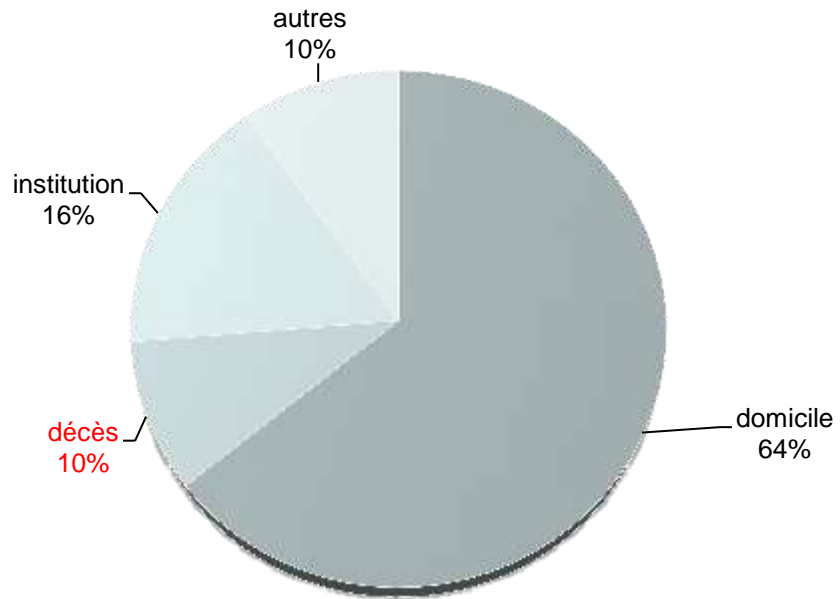
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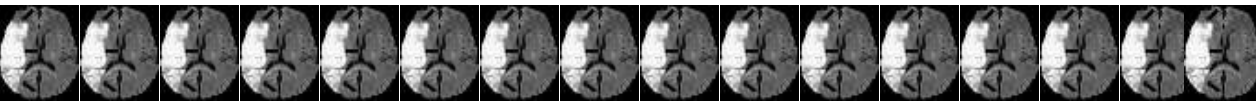
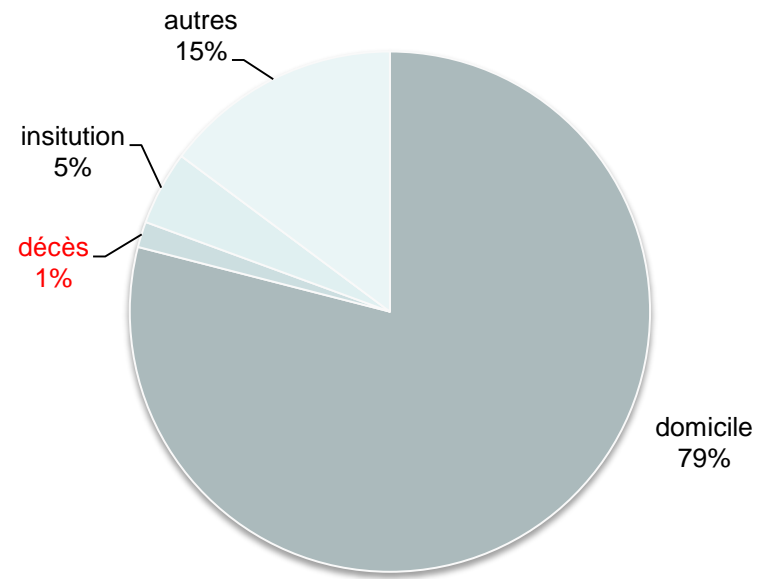
Outcome after NRC



Outcome after GRC

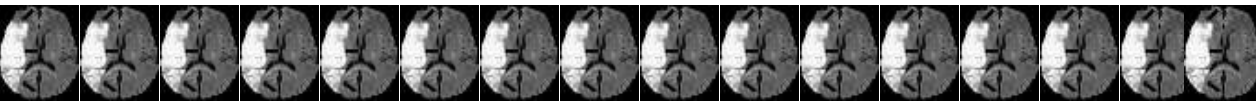


Outcome after NRC



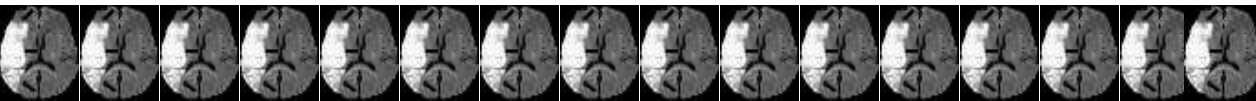
| Factors related to home discharge | | | | |
|---|------|--------|------|--------------------|
| | OR | CI 95% | | p |
| Type of MIR | | | | p<10 ⁻⁴ |
| NRC | 1.61 | 1.42 | 1.82 | |
| GRC (reference) | 1.00 | | | |
| Number of stroke patients admitted yearly | | | | p<10 ⁻⁴ |
| < 50 (reference) | 1.00 | | | |
| 50 - 99 | 1.25 | 1.11 | 1.40 | |
| 100 - 499 | 1.28 | 1.08 | 1.52 | |
| ≥ 500† | 0.46 | 0.37 | 0.57 | |
| Comorbidities (Charlson's Index‡) | | | | 0.004 |
| 0 (reference) | 1.00 | | | |
| 1 à 4 | 0.89 | 0.81 | 0.99 | |
| ≥ 5 | 0.67 | 0.52 | 0.87 | |
| Physical dependence score on discharge | | | | p<10 ⁻⁴ |
| 4 | 3.10 | 2.53 | 3.79 | |
| 5 - 8 | 2.22 | 1.91 | 2.59 | |
| 9 - 12 (reference) | 1.00 | | | |
| > 12 | 0.41 | 0.37 | 0.46 | |
| Behaviour score on discharge | | | | p<10 ⁻⁴ |
| Independence (reference) | 1.00 | | | |
| Dependance | 0.53 | 0.48 | 0.59 | |

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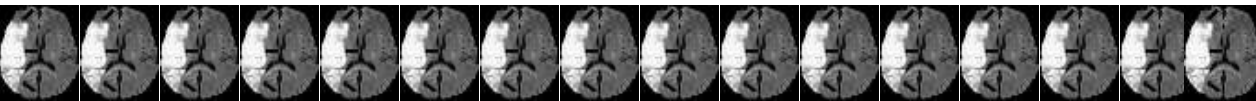
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| 4 | 3.10 | 2.53 | 3.79 | |
| 5 - 8 | 2.22 | 1.91 | 2.59 | |
| 9 - 12 (reference) | 1.00 | | | |
| > 12 | 0.41 | 0.37 | 0.46 | |
| Behaviour score on discharge | | | | $p < 10^{-4}$ |
| Independence (reference) | 1.00 | | | |
| Dependance | 0.53 | 0.48 | 0.59 | |

GRC: general or geriatric rehabilitation centre, NRC: neurological rehabilitation centre, MIR multidisciplinary inpatient rehabilitation



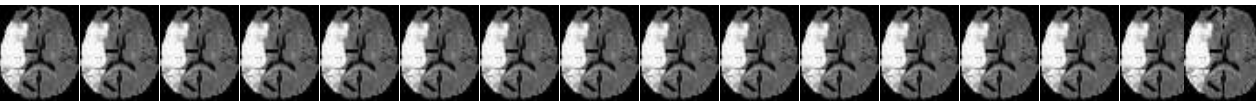
| Factors related to home discharge | | | | |
|---|------|--------|------|--------------------|
| | OR | CI 95% | | p |
| Type of MIR | | | | p<10 ⁻⁴ |
| NRC | 1.61 | 1.42 | 1.82 | |
| GRC (reference) | 1.00 | | | |
| Number of stroke patients admitted yearly | | | | p<10 ⁻⁴ |
| < 50 (reference) | 1.00 | | | |
| 50 - 99 | 1.25 | 1.11 | 1.40 | |
| 100 - 499 | 1.28 | 1.08 | 1.52 | |
| ≥ 500† | 0.46 | 0.37 | 0.57 | |
| Comorbidities (Charlson's Index‡) | | | | 0.004 |
| 0 (reference) | 1.00 | | | |
| 1 à 4 | 0.89 | 0.81 | 0.99 | |
| ≥ 5 | 0.67 | 0.52 | 0.87 | |
| Physical dependence score on discharge | | | | p<10 ⁻⁴ |
| 4 | 3.10 | 2.53 | 3.79 | |
| 5 - 8 | 2.22 | 1.91 | 2.59 | |
| 9 - 12 (reference) | 1.00 | | | |
| > 12 | 0.41 | 0.37 | 0.46 | |
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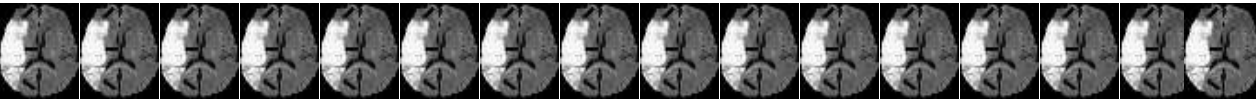
| Factors related to home discharge | | | | |
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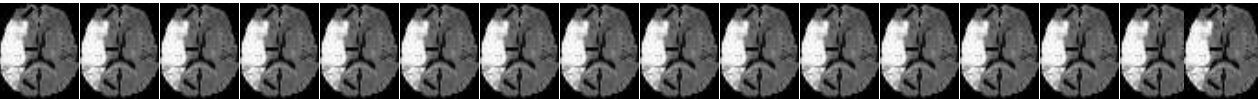
Outcome

- NRC vs GRC
 - Dead OR= 0.298 (IC =0.229-0.388)



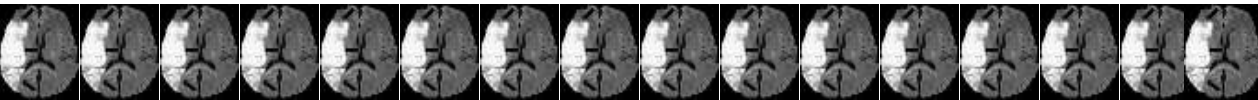
Limits

- This study is based on national medico-administrative databases
- Level of dependence was analyzed using 5 variables in the Rehabilitation database
- No social and cognitive assessment

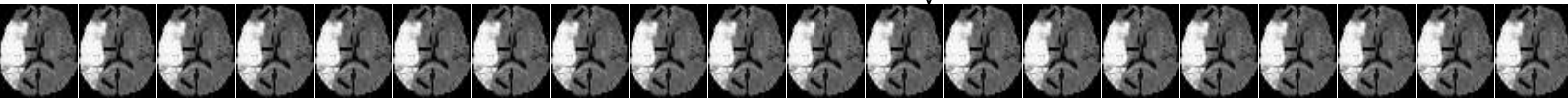
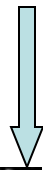


Discussion-conclusion

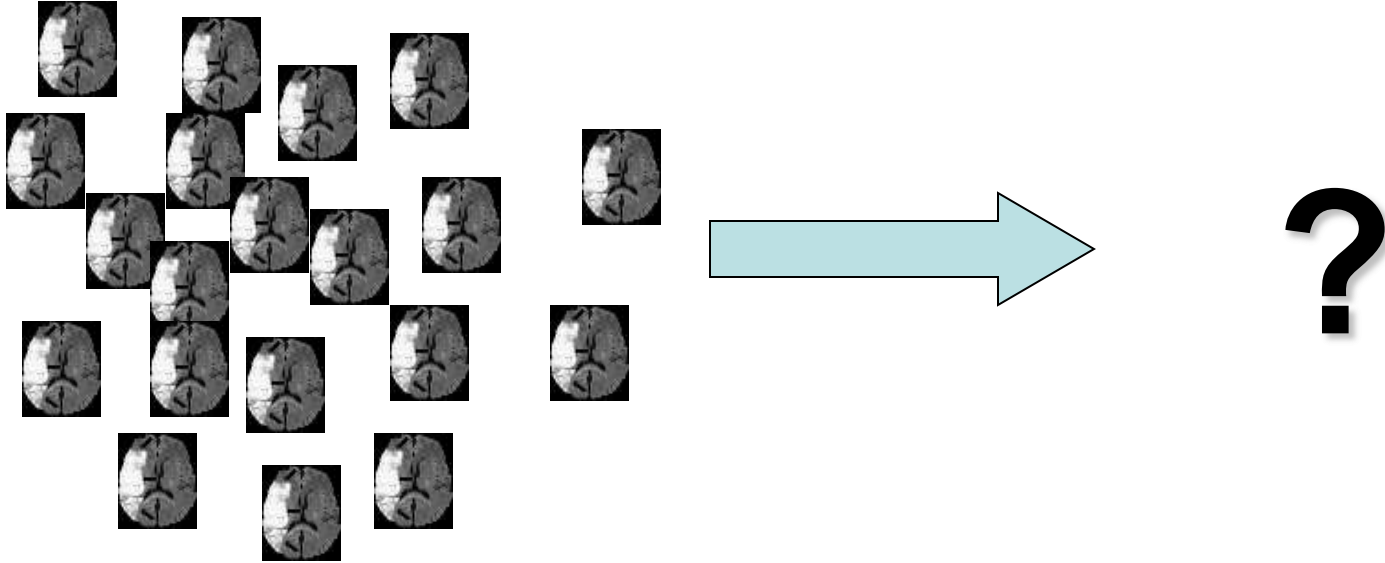
- This study confirms, on a national level, the functional benefit of specialized rehabilitation in NRC.
- These results should be useful in the improvement of care pathways, organization of rehabilitation and discharge planning....



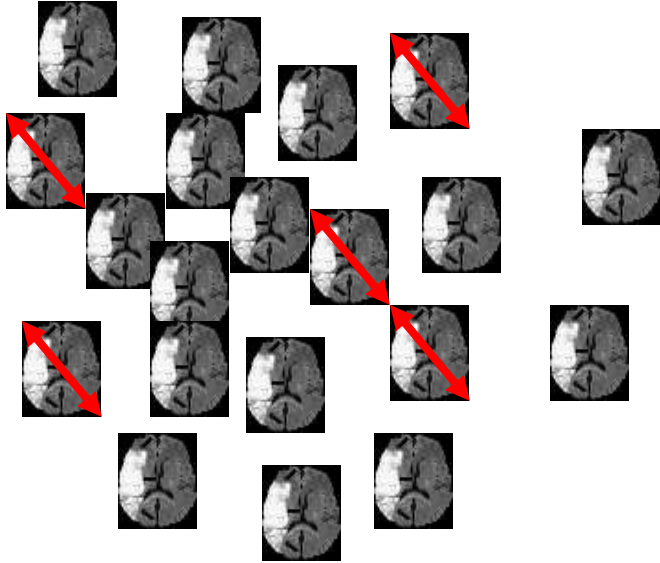
CONCLUSION



1H30 = 20 stroke in France



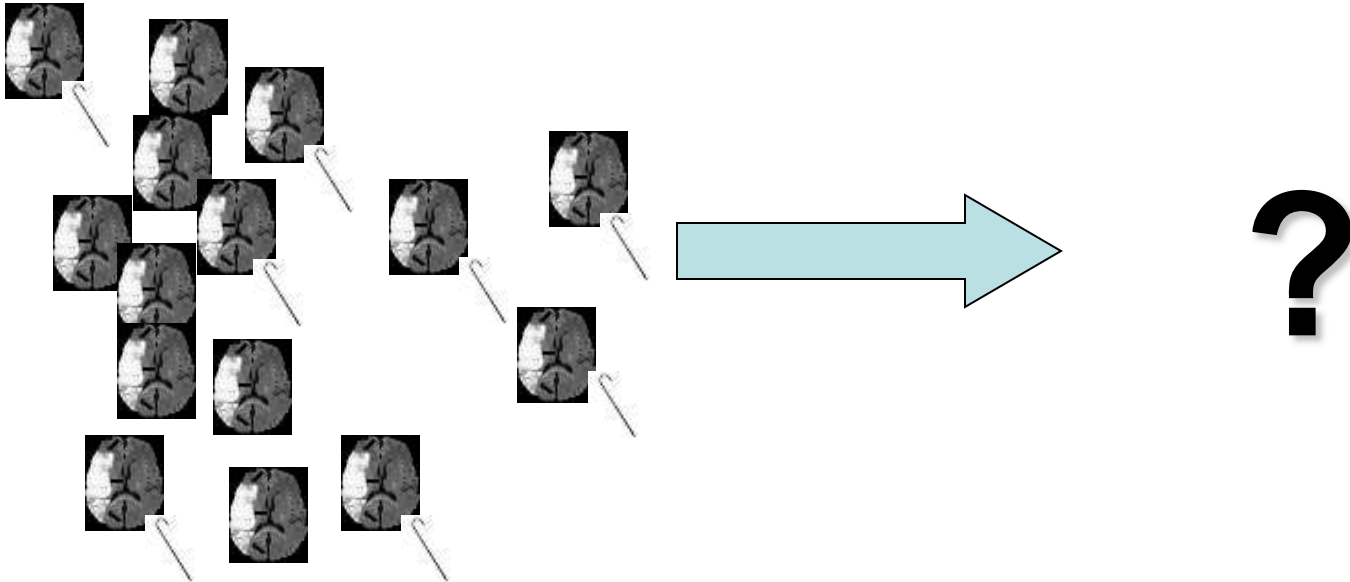
Dead



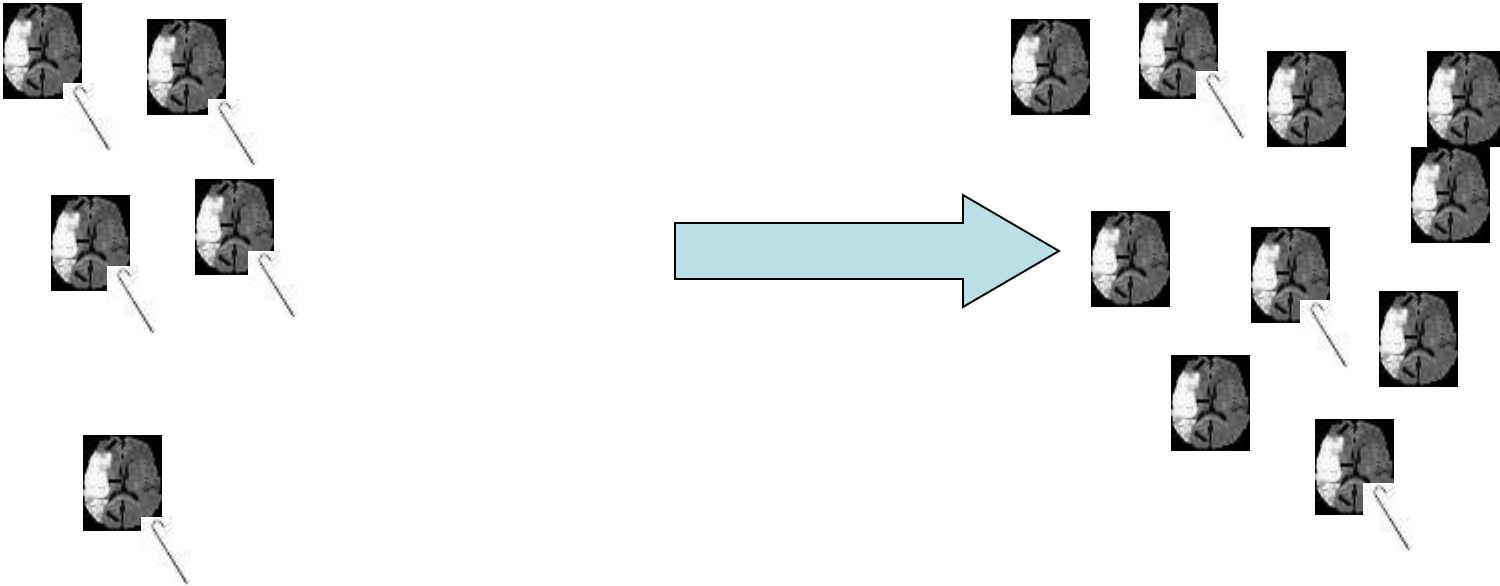
Survivors



Survivors



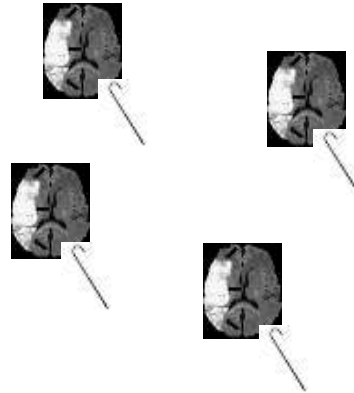
Return to home



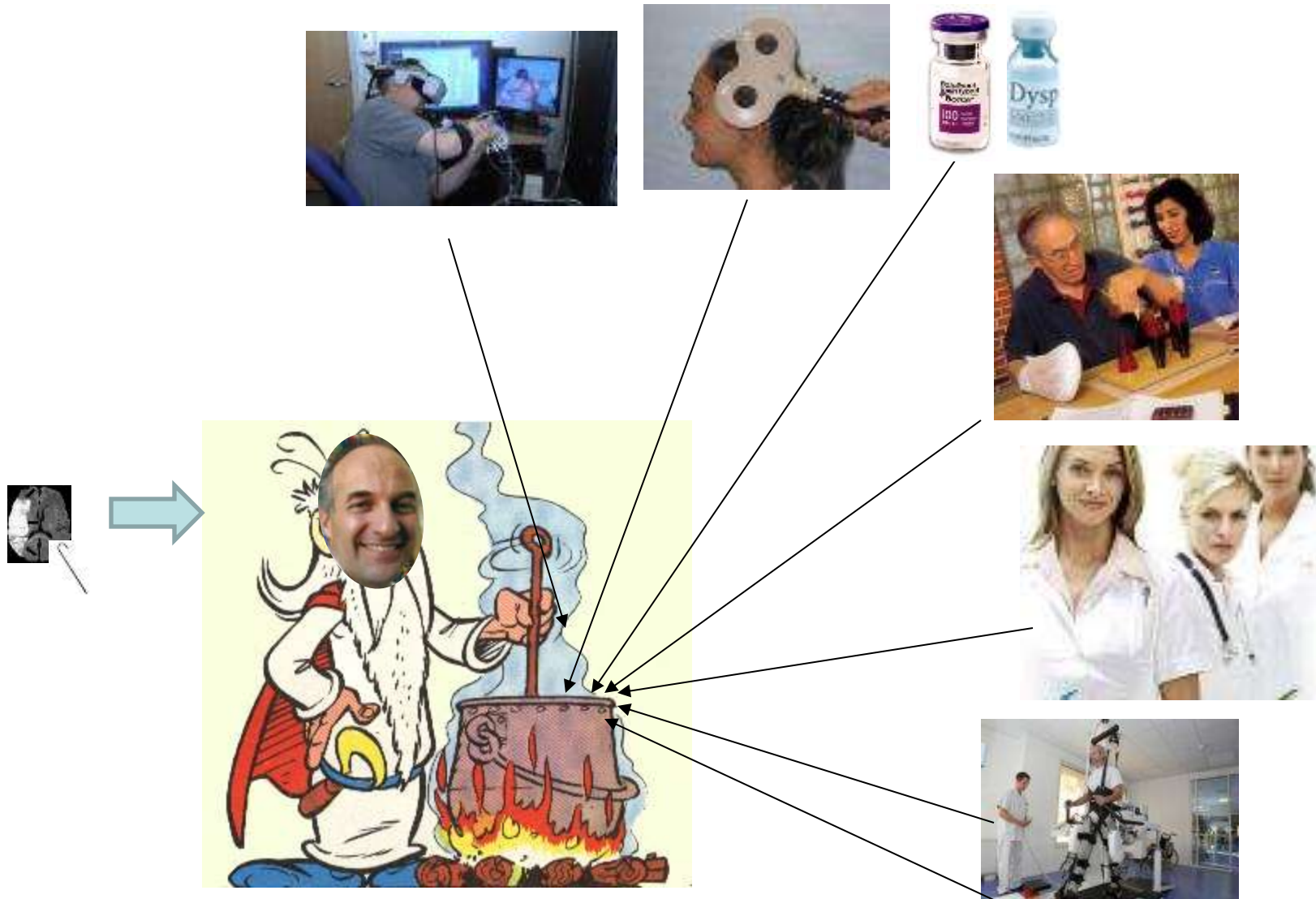
The others



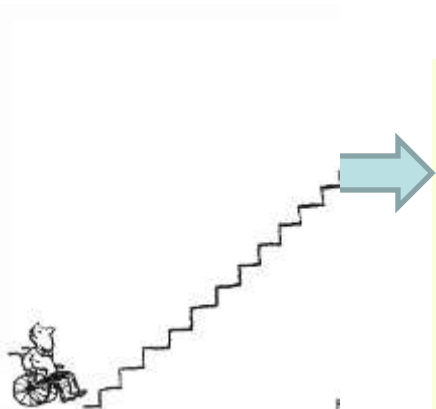
GRC

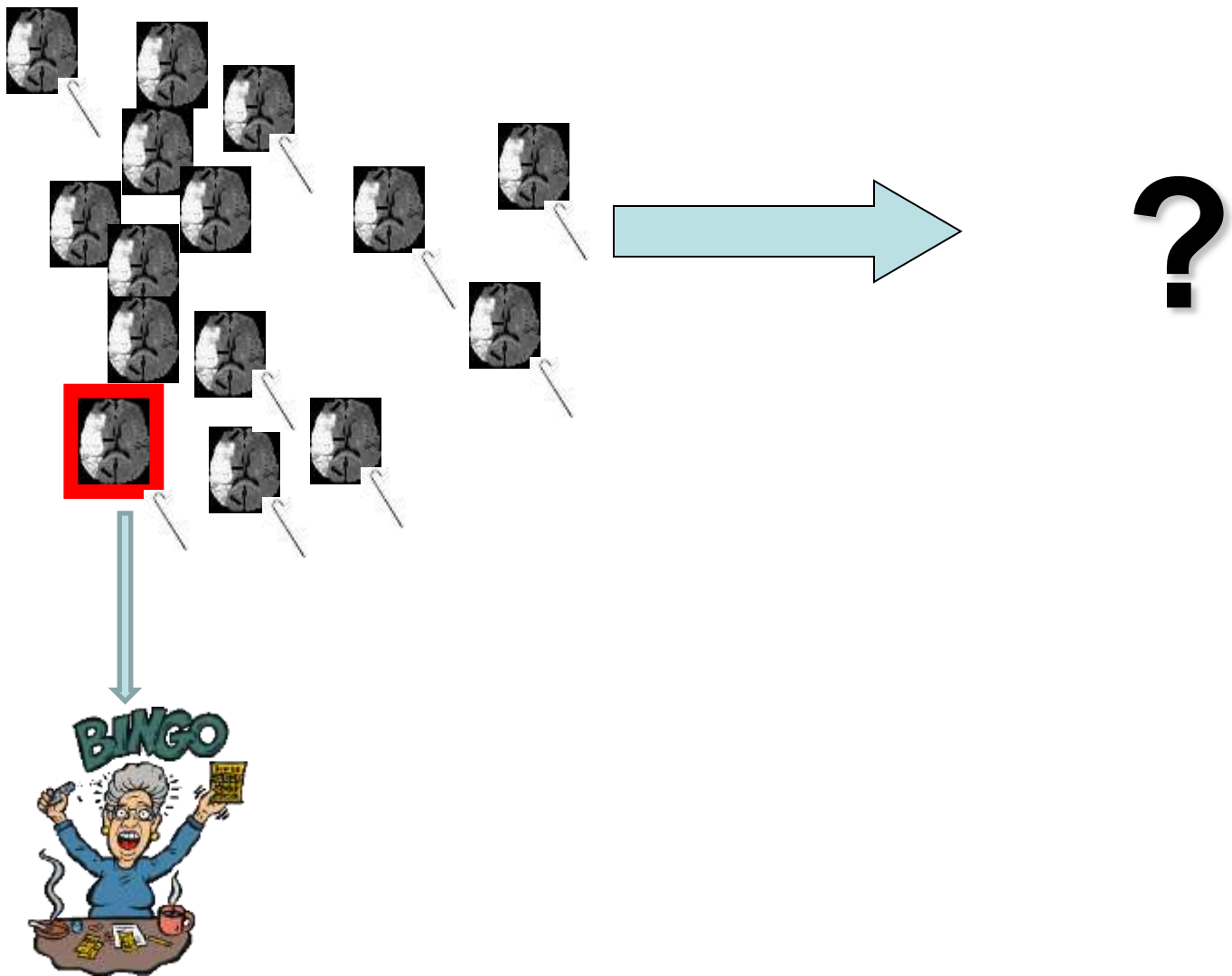


Prise en charge en MPR à la phase aiguë



NRC at the chronic phase...





CONCLUSION

- 8% of the stroke patients are supported by a NRC
- 1 in 2 disabled at the chronic phase
- Improvement of care pathways, organization of rehabilitation and discharge planning are needed

Thank you...

