

Is Neural Therapy cheaper than conventional medicine? A comparison of costs and cost structure in Swiss primary care providers – An observational study

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Abstract

Objectives: The main objective of this study was to analyse differences in treatment costs and cost structure in Neural Therapy (NT) compared to conventional primary care (COM).

Design: The study was designed as a cross sectional evaluation of Swiss primary care providers.

Setting: This survey was part of a nationwide evaluation of complementary and alternative medicine (CAM) in primary health care in Switzerland.

Methods: Demographic and structural data were collected from a sample of 202 primary care providers and their practices (175 in COM, 27 NT) using a questionnaire. Information on treatment costs reimbursed by basic health insurance were obtained from the data pool of Swiss health insurers (santésuisse) and matched to corresponding physicians' data. Consultations of 4103 patients (3003 in COM, 1100 in NT) were documented in a subpopulation of 102 physicians (83 COM and 19 NT). These records provided data on diagnostic and therapeutic procedures and health status of patients.

Results: Patients treated by NT physicians recorded significantly poorer general health and more severe and longer lasting disease conditions than COM patients. The total costs generated per patient per year were 820 and 854 Swiss Francs for NT and COM respectively and weren't significantly different between groups. Cost structure, however, was significantly different. In NT, 47.4% of total costs per patient were due to consultation related costs (36.5% in COM) and 41.7% to medication related costs (52.2% for COM).

Conclusion: The results provide no evidence of significant differences between NT and COM in Switzerland for annual treatment related costs per patient. However, significant differences in cost structure reflect differences in treatment modality. NT is mostly an invasive treatment. Therefore prolonged consultation times have the main influence on costs. However, the prolonged consultation times also result in a significant higher patient satisfaction compared to CAM.

Keywords: neural therapy, primary care, health insurance expenditures, cost structure

Introduction

Due to growing consumer demand(1) and after a long-lasting political discussion, the Swiss Federal Department of Home Affairs decided in 1998 to include five complementary and alternative treatment procedures in the benefit package of basic health insurance for a trial period of seven years. Reimbursement of expenditures was covered by the basic health insurance only if a physician had a license in one of the alternative medical disciplines approved by the Swiss Medical Association (FMH). A nationwide evaluation program (PEK)(2) aimed at the evaluation of efficacy,

effectiveness and cost efficiency of alternative and complementary medical procedures in Swiss primary care was then initiated by the same department. Within this project the study analyzed the extent and structure of generated costs of neural therapy compared to conventional treatment procedures.

Neural therapy (NT) is, according to Huneke, a regulatory treatment based on specific injections with local anesthetics (mainly Procain or Lidocain) for diagnostic and therapeutical purposes(3). Main indication is chronic pain in the musculoskeletal system. The treatment distinguishes two application models: A local or segmental injection to trigger points, joints, HEAD-zones, injection on nerves and/or ganglia of the autonomous nervous system. And the testing or treatment of the so called interference-field to interrupt its disturbing influence (e.g. affection of a tooth), which may affect any system of the organism, even beyond segmental order(3-5). Local anesthetics are used to achieve the therapeutic goal. They act as a mediator and cause temporal interruption of pathological strains (e.g. vicious circle in pain)(6) to allow autoregulation(3, 6). The main treatment effects in NT are directly related to the pathophysiology of pain and involve pain regulation by the autonomous nervous system(6-10) as show in neurophysiologic experiments(11, 12).

Therefore it is of interest how neural therapy, being mostly an invasive diagnostic and therapeutic procedure, influences the structure of generated costs compared to a conventional treatment.

Based on the concepts of Donabedian(13), we analyzed structural data of physicians and practices, and information about the processes of care and data of yearly health expenditures, obtained from all Swiss health insurers (santésuisse) as the main outcome.

Methods

Design

The data for this study are drawn from a nationwide cross-sectional survey of initially 360 primary care physicians and 11,932 adult patients(14) .

Two groups of physicians were defined for the study, based on self declared medical activity and professional qualification:

- **COM physicians:** Physicians performing no CAM procedures (conventional primary medical care physicians).
- **NT physicians:** Dual-trained Physicians performing NT and COM procedures with NT certificates provisionally recognized by basic health insurance

Additional inclusion criteria for both groups required that physicians were working at least 2 days a week in an ambulatory practice and the availability of reimbursement data for 2002/3 obtained from the data pool for 2002/2003 of all Swiss health insurers (santésuisse).

Data collection

All physicians listed as members of Swiss societies for alternative medicine, including homeopathy, anthroposophic medicine, neural therapy, phytotherapy and Chinese medicine, were asked to participate and a random sample of primary care physicians, not members of any CAM society, was also invited to participate. The size of this sample

was 1.5 times larger to compensate for potential lack of interest in COM physicians for this study. Originally 2,266 primary care providers were asked to participate in the survey by a questionnaire on a voluntary basis. Non-responders were reminded with a second letter one month later. 724 physicians (32%) enlisted for the first phase of the PEK study to assess structural attributes of care. Data from 202 physicians fulfilling the eligibility criteria of this study were available. The second step of the project, aimed at the evaluation of diagnostic and therapeutic procedures, originally included 364 physicians and a subsample of 102 physicians was eligible for this study (19 certified NT and 83 COM physicians) and 4,103 consultations were documented in this context.

Data collection was based on questionnaires and reimbursement data were obtained from the data pool of all Swiss health insurers (santésuisse), matched with corresponding records of physicians. Consultations were documented by patients in the waiting room on a voluntary basis with a questionnaire aimed at socio-demographic characteristics, duration and severity of symptoms, general health status, expectancies and reason for choosing their physician. For the same consultation, physicians recorded data with reference to duration and severity of symptoms, main diagnoses and co-morbid conditions, diagnostic and therapeutic procedures. Study design and data management ensured that physicians remained unaware of patients' answers.

The collection of data took place within four predetermined days over a twelve month period (October 2002, January, May, and August 2003). Days were defined by the study coordination and equally distributed throughout the week and physicians were refunded with 500 Swiss Francs each for their contributions.

All questionnaires used in this project were developed in cooperation with an expert group of Swiss primary care providers, specialized in conventional and/or complementary medicine. The ethics committee of the Canton of Bern raised no objection to the study.

Data management and data analysis

All data were recorded using a relational database. Initial analyses included descriptive and univariate procedures provided in tables and graphs. Structural and cost data were available at the practice level and average reimbursements per patient were calculated based on total yearly costs generated by each physician and divided by the number of annual patients. Linear models were used to analyze differences of major cost components and models included the following explanatory variables:

- Type of physician: NT or COM physicians
- Gender of physician
- Experience of physician as years since graduation
- Type of practice: individual or group practice
- Canton: Geographic location of practice in Switzerland
- Urbanisation of practice location: central city, suburb, isolated town or village, rural area
- Proportion of consultations with female patients per year
- Average age of patients
- Proportion of home visits per year

- Proportion of accident related consultations per year

The selected co-variables were based on preliminary, univariate procedures and collinearity and correlation among co-variables was checked and appeared not to be a problem. Results were interpreted as least-square means (LS-Means) with 95% confidence intervals (CI95). Residual analyses were applied to assess the fit between observed and modelled data, and multivariate power calculations were performed in case of no significant differences. The amount of variance of outcomes accounted for by the models was expressed using R²-values. Residual analysis of alternatively applied log-linear models showed a similar fit between observed and estimated data; data analyses were therefore based on the original data. All cost data are given in Swiss Francs (CHF) as of 2003.

Consultation data were analyzed using multivariate and hierarchic logistic regression models to account for clustering of observations at the practice level and 95% confidence intervals (95% CI) of means, proportions and odds ratios were calculated accordingly. Co-variables of models were defined prior and were aimed to adjust for demographic factors of patients (age and gender).

The level of significance was set at $p < 0.05$ throughout the study. SAS 9.1 (SAS Institute Inc., Cary, NC, USA) was used for all calculations.

Results

The final sample for this study comprised 202 physicians for analyzing structure and costs of care of which 27 physicians (13.4%) were certified neural therapists and based on self declaration, 175 physicians (86.6%) performed only COM procedures. The 27 NT physicians represented 39.1% of all certified NT physicians in Switzerland in 2002 and the 175 COM physicians 3.2 % of their respective base population. No significant differences between sample and base population were seen for the geographical distribution across cantons for both groups of physicians. Data of 4,103 consultations (1,100 consultations from NT and 3,003 consultations COM physicians respectively) were available to analyze the processes of health care.

Demographic and structural attributes of physicians and practices

The geographical distribution was notably different with no NT physicians in French or Italian speaking parts of Switzerland, whereas COM physicians were distributed over all Switzerland. In urban regions more NT physicians (56%) were found compared to only 34% COM physicians respectively. Also 15% of NT had significantly more waiting lists (COM 2%), longer waiting times of which 20% waited > 3 month (COM 4%) and a higher workload with a mean of 56.4 hours a week compared to 53.8 for COM physicians. However, the sample showed no differences in the mean age, years since graduation and in both groups, most physicians were male (>80%). No difference was found in distribution concerning the workload (working full time) and the practice type (single or group practice). Laboratories and ECG were equally available in both groups, but significantly more COM practices were equipped with X-ray (83%) compared to the NT practices (52%) (*Table 1*). Analyses of the characteristics of consultations revealed that NT made less home visits (2%) compared to COM (4%).

Demographic and structural attributes of patient population

Based on the insurance data, the average age of patient populations were 47.3 years in COM and 46.2 years in NT respectively, the proportion of consultations for female patients was 59.4% in COM and 64.2% in NT.

From the total sample of 4103 patients, COM physicians treated 3003 patients (73%) and NT 1100 patients (28.0%). The average age of patients in the sample was 51.9 years. The overall proportion of women was 59.2% out of which significantly more women attended a NT (66%) than a COM (57%) physician. Patients were asked to rate their general health on a five-point Likert scale ranging from excellent to poor. A significantly lower self-rated health status was found in NT patients (30.3% rated "less well/bad"). General health was significantly influenced by age, chronicity of symptoms, female gender, and NT. Each of those factors contributed significantly to the lower rating of the patient's general health. Patients recorded the duration of their main health problem in months with a mean of 50.3 months in COM and 67.2 months in NT. According to the duration the patients were divided into two groups: acute (< 3 month) and chronic patients (\geq 3 month). The proportion of chronic patients was analyzed using a logistic regression model adjusted for age and gender. Results indicate a significant higher proportion of chronic patients in NT (61%) compared to COM (42%). Patients were further asked to rate the severity of their main symptom using a three level scale. These results yielded a significantly higher percentage of patients with moderate and serious symptoms in NT (87.5%). Additional models, with the degree of severity as the outcome variable, show that the attended practice ($p < 0.001$) and chronicity ($p < 0.001$) had an effect but age and gender were not significantly associated with the outcome variable. (Table 2)

Assessment of diagnosis and treatment process

The results concerning diagnosis and treatment processes comprise a smaller sample of 102 physicians (83 COM and 19 NT) and of 4,103 patients (3,003 in COM and 1,100 in NT). In COM practices 2,612 (87%) patients received only conventional therapy, 315 (10.5%) no specific prescriptions, 35 (1.2%) other non-specified treatments and 17 (0.6%) combined conventional and complementary treatments; however, no NT therapy was given by any of the COM physicians. Of the 1100 NT patients, 348 (31.6%) were treated with conventional therapy only, 290 (26.4%) with NT only, 64 (5.8%) received no specific therapy, 124 (11.2%) other non-specified treatments, 84 (7.6%) a combination of conventional and alternative treatment, finally 69 (6.3%) patients were treated with a combination of NT and another alternative treatment type (e.g. NT and homeopathy).

Age and gender adjusted consultation time for all patients was significantly longer in a NT practice (mean=19.4 min.) than in a COM practice (mean=16.8 min.). Women with chronic problems had longer consultation times (18.4) compared to men (16.7). COM practitioners had 1268 patients with chronic problems (42.2%) with a mean consultation time of 17.6 min., while NT had 670 chronic patients (60.9%) with a mean consultation time of 20.0 min.

Work disability documents were issued (all patients between 16 and 64 years of age) significantly more frequently for patients attending a COM physician (13.2%) than for a NT (5.7%) patient group (adjusted odd ratio= 1.5 (1.2-1.7) and the following variables

had a significant influence on this item: chronicity, the female gender, and age (surprisingly, younger patients had more temporary work disabilities).

Health insurance expenditures

NT physicians treat significantly less patients per year (COM 990 and NT 891 patients per year). The average number of consultations per year also differs significantly between COM (3,951) and NT (4,404), home visits included. Because patient and consultation numbers are affected by full- or part-time activity of physicians we also analyzed the number of annual interactions between patient and practitioner. The adjusted number of consultations per year were significantly different ($p < 0.009$, power = 0.46, $R^2 = 0.58$): COM 3.90 (CI95: 3.5-4.3) and NT 4.59 (CI95: 3.9-5.1).

The empiric average of total amount of generated costs per year and patient was 912 Swiss Francs in COM and 777 Swiss Francs (CHF) in NT. By splitting these costs into consultation related, referral and medication related costs we could detect significant differences between to two groups (*Table 3*). Referral costs and amount of total costs for medication are lower for NT. In contrast direct consultation costs were higher in NT (415 CHF) compared to COM (334 CHF) respectively.

However, there are considerable effects of co-factors to be considered in these comparisons. The most important factors refer to differences in structure of practices and patients' demographics. Structural attributes of a practice involve location, type, consultation patterns, gender and experience of the practitioner. It is important in this context, that the Swiss health system is organized on cantonal level, implying the co-existence of 26 different reimbursement systems. Demographic differences of patients are mainly due to age and gender. All these factors were to some extent associated with cost outcomes in the multi-variate models used. These models show that the total costs per patient did not differ significantly between the two groups of physicians ($p = 0.51$, power = 0.79, $R^2 = 0.64$) (*see Table 4*). However, the consultation related costs were significantly higher in NT ($p < 0.001$, power = 0.96, $R^2 = 0.51$). In contrast, total costs of medication (prescribed and dispensed) were significantly lower in NT ($p < 0.003$, power > 0.99, $R^2 = 0.69$). No significant differences could be found for referral costs.

Therefore, a look at the percentages of the three portions of costs (consultation related, referral and medication costs) reveals that in NT 47.4% of total costs per patient were due to consultation related costs (36.5% in COM) and 41.7% to medication costs (52.2% for COM). (*Fig. 1*)

Discussion

There are ongoing and controversial discussions(15-17) about the economic efficiency of alternative and complementary medicine within Swiss primary care. The study focused on comparing data on health insurance expenditure with those from the nationwide cross sectional survey, evaluating the use of conventional and/or alternative treatment in primary care for neural therapy.

Structure of care

The higher percentage of NT in urbanized regions suggests that NT physicians treat a different patient population(18-20) than conventional primary care providers, an

observation which is also supported by the fact, that these physicians conduct less home visits. However, both groups cover the whole spectrum of ambulatory health care. Statistically significant differences for presence and duration of waiting point to considerable demand for NT in ambulatory care. Differences in the presence of x-ray equipment are likely related to the predominance of NT in urban regions where x-ray facilities are easily accessible.

Health status of patients and treatment process

Our results confirm findings that NT practitioners treat fewer patients per year have longer consultation times, more patient interactions and perform more often invasive treatment procedures most likely due to the specific indication of musculo-skeletal disorders(30) . In agreement with other reports, NT physicians treat more women(18, 21) and the percentage of patients with chronic and/or co-morbid conditions is higher than in COM practices(19, 22-25) and other evidence shows that NT is more often the last therapeutic option, especially for referred patients with chronic diseases when all other therapies fail(26). A closer look in this context reveals that consultation times in NT are skewed towards long consultations which can be explained not only by distinct patient population(19, 20) but also as more time consuming procedures are applied (e.g. injections into ganglia of the autonomous nervous system).

Extent and structure of health insurance expenditures

The empiric results obtained showed significant difference of total generated health care expenditures with COM being more expensive(27, 28). However, adjusting the models for various structural and patient related co-factors, the outcome reveals no significant difference of total health care expenditures.

The breakdown of costs into cost components shows that the highest percentage of costs in NT are consultation related, whereas medication related costs are the most important component in COM. The reasons for higher consultation related costs in NT are based on two distinct elements related to longer consultation times: A first portion consists of a tax point scale for total time for 'diagnosis- and treatment-making' and a second part of a tax point scale for the interventions provided. Though, invasive procedures e.g. deep injection fall more into weight. This indicates that higher consultation related costs in NT are mainly the result of a specific interventional therapy. An important finding in the context of cost analysis was, however, the fact that NT physicians issued less work incapacity attestations than their COM peers. These data indicate, therefore, that indirect treatment cost (i.e. cost related to loss of work time) of NT may be lower than conventional care, despite NT patients having more chronic and more severe disease conditions.

Limitations and strengths

Several limitations of this study should be discussed. These include selection bias, non-representing sampling and effects of variables unaccounted for. There may be some bias due to differences in the motivation of the groups reflected in the empiric number of patients sampled as seen in the PEK final report [2]. Due to the enduring discussions about coverage by the basic health insurance, the NT patient population was more motivated to take part in the study. Administrative data of the Swiss medical association

and billing data indicate, however, reasonable proximity between sample and base populations for the geographic distribution and basic demographic attributes of patients. Another limitation refers to the nature of cost data available for the study. Cost data were only available at the practice level and not at the consultation level which impeded a direct analysis of factors related to the health status of individual patients in the context of cost analyses. Studies on costs-efficiency have not yet been performed for NT, so that comparison of our findings is not possible.

The strength of this study refers to the availability of complete billing data of participating practitioners in contrast to other research(29). There was a considerable amount of variance of empiric data which could be accounted for by statistical models which had also enough statistical power to provide valid comparisons.

Conclusion

Our findings show no significant differences in the total amount of health expenditures between the two groups despite the fact that NT physicians treat patients with more severe and chronic conditions. However, we found differences in structure of these costs. Based on the PEK final report and a recently completed outcome study providing empirical evidence of high patient satisfaction in NT(30), we conclude that neural therapy is equally competitive regarding costs. It provides a good alternative for treatment of musculo-skeletal diseases in particular. Furthermore, patients benefit from a medication reduced therapy.

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Table 1: Socio-demography of physicians population

		COM		SANTH (NT)	
		#	%	#	%
Physicians^a	<i>Number^a</i>	175		27	
Physicians age (Years)	<i>Mean</i>	52.5		52.3	
Workload	<i>100%</i>		87		100
Years since graduation	<i>Mean</i>	23.5		22.4	
Medical practice	<i>Single</i>		69		82
Work time (hours/week)	<i>Mean</i>	53.8		56.4	
Waiting list[*]	<i>Yes</i>		2		15
Waiting time[*] (month)	<i>0</i>		65		33
	<i>0-1</i>		29		33
	<i>>1</i>		6		34
Practice infrastructure	<i>with X-Ray[*]</i>	146	83	14	52
	<i>with Lab</i>	170	97	25	85
	<i>with ECG</i>	172	98	25	82
	<i>with US</i>	44	25	8	30

^aSample of N = 202 practitioners

^{*}significant difference (p<0.05)

Table 2: Socio-demography and health status of patient population

		COM			SANTH (NT)		
		#	%	CI 95	#	%	CI 95
Patients	<i>Number</i>	3003			1100		
Patient age	<i>Mean</i>		50.3			48.2	
Female Patients [*]	<i>Proportion</i>	1700	57		726	66	
Education	<i>Proportion of higher education</i>		20.0	16.7-21.2		21.0	15.7-26.7
General health ^{* a}	<i>excellent</i>	171	5.8	4.9-6.8	38	3.5	2.3-4.7
	<i>very good</i>	623	21.3	19.1-23.4	204	19.4	15.5-24.0
	<i>Good</i>	1461	49.9	47.9-51.8	505	46.8	43.1-50.5
	<i>Fair</i>	575	19.6	17.4-21.9	271	25.1	20.5-29.7
	<i>Poor</i>	100	3.4	2.7-4.1	56	5.2	3.0-7.3
Duration of main health problem ^{* a c}	<i>Mean (Month)</i>	50.3		44.5-56.0	67.2		51.0-83.3
Chronic conditions ^{* a}	<i>> 3 month</i>	1268	42	39.6-44.8	670	61	52.8-69.0
Severe symptoms ^{* a}	<i>Moderate-serious</i>	1973	76		896	87	
Comorbidity ^b	<i>≥ 1 symptom</i>	1723	58		781	64	

*significant difference (p< 0.05) to COM group

^apatient rated^bphysician rated^cproportion of chronic patients was adjusted for age and gender

Fig. 1 Cost structure

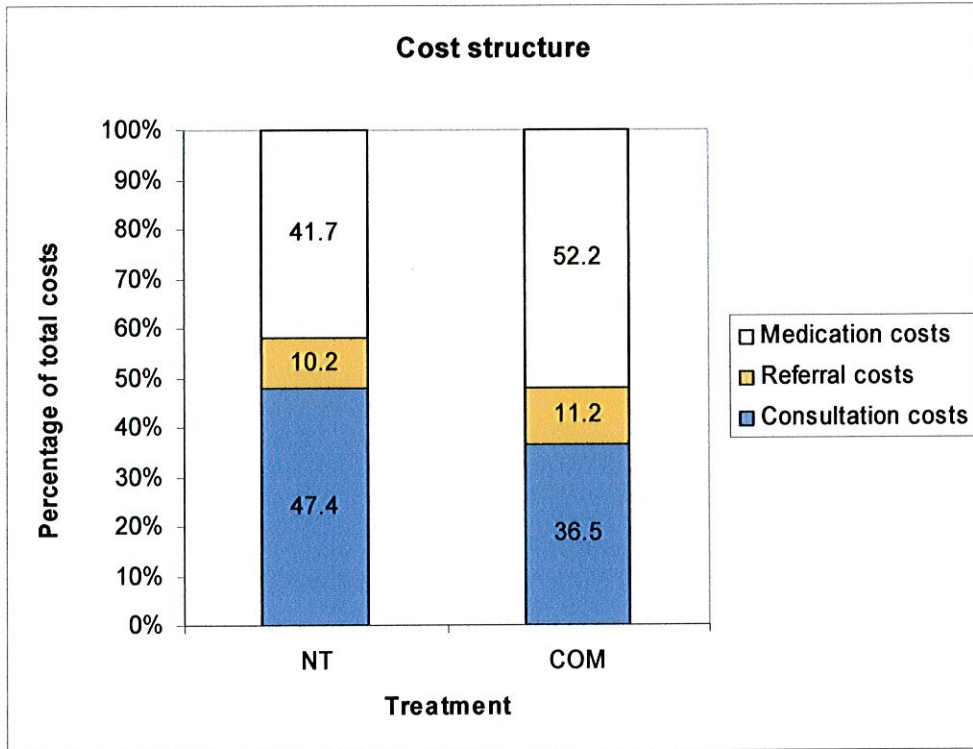


Table 3 Means, medians of reimbursements per patient in Swiss Francs

Type of reimbursement	SANTH (NT)		COM	
	mean	median	mean	median
Consultation related costs	415	383	334	315
Referral costs	75	62	99	89
- Lab analyses	36	28	42	33
- Physiotherapy	39	27	56	53
Total costs for medication (directly dispensed & referred)	288	253	484	458
- Costs of dispensed medication	140	64	146	47
- Prescriptions	149	55	336	278
Total costs^a	777	683	912	878

^aMeans of total cost are not the exact sum of estimates of other cost components

Table 4 Model based means (LS-means) and structure of reimbursements per patient in Swiss Francs

Type of reimbursement	SANTH (NT)			COM		
	LS-mean	CI 95	% [§]	LS-mean	CI 95	% [§]
Consultation related costs *	389^a	325-452	47.4	312^c	271-353	36.5
Referral costs	84^a	52-115	10.2	96^{ab}	76-115	11.2
- Lab analyses	34 ^a	16-52	4.1	38 ^c	26-50	4.4
- Physiotherapy	49	29-69	6.0	58	45-70	6.8
Total costs for medication * (directly dispensed & referred)	342^a	247-436	41.7	446^c	386-507	52.2
- Costs of dispensed medication	109 ^a	28-190	13.3	144 ^c	92-196	16.9
- Prescriptions	239 ^a	120-358	29.1	304 ^c	228-380	35.6
Total costs[†]	820	670-969	100.0	854	758-950	100.0

* Significant overall difference between groups ($p < 0.05$)

§ Percentage of total cost per patient

^{a, b, c} Different superscripts indicate significant differences between groups (multivariate log-linear models)

[†] LS-means of total cost are not the exact sum of estimates of other cost components

Table 5: Treatment of disease (physician)

	COM		No therapy		NT		Other		CAM+COM		CAM+CAM	
	#	%	#	%	#	%	#	%	#	%	#	%
COM	2670	87	320	10.43	0	0	36	1.17	19	0.62	0	0
SANTH (NT)	333	32.52	61	5.96	289	28.22	102	9.96	84	8.20	68	6.64