

Comparative Analysis of Pediatric Mailing Lists on the Internet

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ABSTRACT. *Objective.* To analyze quantitative aspects and the relative quality of various pediatric discussion groups on the Internet and to contrast them with qualitative aspects of a selected number of pediatric journals.

Material and Methods. An extensive number of mailing lists on the Internet of interest to pediatricians was compiled. Twelve of them concerned with pediatric specialties were selected. Six representative journals of pediatric specialties were also analyzed and compared with the corresponding mailing lists. From the list of subscribers we studied the potential quality of each mailing list. The postings sent by each member to the on-line discussions were also analyzed. As an estimate of the standing as author of each list member as well as of each first author of the selected journals, we calculated several indexes of quality using the 1995 Medline database and the impact factors of the biomedical journals reported by the 1994 Science Citation Index.

Results. The most popular lists were NICU-NET and PICU, both having more than 1100 subscribers. PEDPATH and PEDIHEART had the highest percentage of subscribers who were published authors, and their papers also yielded the highest impact factors. The most active lists were NICU-NET and PICU. The most participative ones were CHILD-NEURO and PED-LUNG. CHILD-NEURO had the highest percentage of authors among the participants. PEDPATH and CHILD-NEURO had the authors with the highest impact factors among the people who participated in the discussions. These latter two lists also showed the highest impact factor per posting. Those which had the highest yield (highest activity with highest quality per posting) were CHILD-NEURO and PEDIHEART. The average impact factor per first author of the analyzed journals was always higher than the average impact factor per participant of the lists.

Conclusions. The electronic-mail discussion groups on the Internet are new nonacademic forums in which knowledge and experience in pediatrics can be shared. They cannot replace but they complement other more academic sources such as medical journals. *Pediatrics* 1997;100(2). URL: <http://www.pediatrics.org/cgi/content/full/100/2/e8>; *Internet, mailing lists, pediatric information sources.*

ABBREVIATIONS. IPQ, Index of Potential Quality; IFp, impact factor per participant; IFe, impact factor per posting; IFa, average impact factor.

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The diffusion of information is crucial to the progress of medicine. The great profusion of conferences, courses, and specialized journals allows a reasonably fast dissemination of knowledge. Nevertheless, electronic mail offers a low-cost and faster system of information exchange that has been used extensively in the academic environment. The growth of the Internet during the last few years has enhanced this way of sharing information, becoming a popular way of communication among nonacademic professionals.

Mailing lists are discussion groups usually focused on a subject, whose members or subscribers interchange messages by electronic mail. Some mailing lists are manually maintained. Others are maintained by a number of commercial and public domain software packages including Listserv, Majordomo, Listproc, and others. Postings sent to the group are received by computers which run these softwares or list servers, and automatically send them to all the members of the mailing list. Thus, the comments may be read and discussed by the other subscribers, and an electronic dialogue of comment, reply, and further replies is established as an international conference on a topic held daily.¹⁻⁹ The subscription to a mailing list is free. All that is required is a standard electronic-mail account and a simple piece of communication software.

The degree of control during postings to a mailing list server varies widely. The lowest level of control is restricting postings to members of the list. This prevents nonmembers, particularly advertisers, from posting to the mailing list. The next level is to subject each posting to a process in which only messages that the manager of the mailing list approves are available by the members of the mailing list. The highest level of control includes both the posting approval and its edition as needed. The more control a moderator exercises on a list the more work is involved. Although the quality of a moderated list is generally better it is at the expense of some spontaneity.

The arrival of the Internet and its electronic forums of discussion in the field of biomedicine are generating concern as to whether the opinions expressed in this media are sufficiently reliable.² Consequently it has been suggested that certain measures of control should be introduced into these ever-changing, somewhat chaotic groups that have emerged as a result of computer networks. One possible way to evaluate opinions that are expressed on-line is to check up on the credentials as authors of the participants by looking at their inclusion in bibliographical

databases. This is the approach we took to analyze both the potential and real quality of a subset of pediatric Internet discussion groups. At the same time we have also compared these groups with the more traditional forum of medical journals in which the latest medical findings are presented.

MATERIALS AND METHODS

From March 1 to June 30, 1996 we analyzed a subset of unmoderated and professional discussion groups (mailing lists) specializing in pediatric topics. We reviewed the lists of subscribers, some general statistics supplied by automated mailing list servers and the messages sent by members on-line.

Calculation of IFa Among Subscribers on Each Mailing List

After randomizing the whole list of subscribers of each group (N) we selected a representative sample from each one as previously described.¹⁰ Exploratory random samples of n_x size from each list of subscribers were obtained to calculate the IFa and the quasivariance for each group (S_x). Under these conditions, the IFa of each exploratory sample follows a t -Student distribution (with n_x-1 degrees of freedom) instead of a normal distribution. The representative sample size (n) is derived from the quasivariance (S_x) and the estimation error (e):

$$e = K\sigma_x^2 = K\frac{S_x^2}{n^{1/2}}$$

in which σ_x^2 is the population variance, which is estimated by $S_x/n^{1/2}$.

Leaving n from this equation:

$$e^2 = \frac{K^2 S_x^2}{n}$$

$$n_x = \frac{K^2 S_x^2}{e^2}$$

in which n_x is assumed for infinite populations.

K was obtained from the t -Student table with n_x-1 degrees of freedom for a specific probability (in our case a probability level of 95%, with type I error equaling .05). Then, an iterative process of increasing the degrees of freedom was performed until two equal consecutive n_x values were found. The final representative sample size for finite populations (n) from each mailing list (N) is derived as follows:

$$n = \frac{n_x}{1 + n_x/N}$$

The names of all members from these samples were searched in the Silver-Platter (Silver Platter, Int, Boston, MA), Medline bibliographic data base on the January 95 to December 95 CD, 1995 edition. The impact factor of each of their papers was obtained after the Science Citation Index (Institute for Scientific Information, Philadelphia, PA) 1994. The sum of all the individual impact factors divided by the size of each sample gave an Index of Potential Quality (IPQ) for each mailing list.

We also studied all the postings sent to each mailing list. The less active lists were observed throughout a longer period of time to avoid missing any high quality posting. Each member who posted to the list was identified and searched as an author in Medline, and the impact factor of each article was obtained as mentioned above. The sum of the impact factors of these articles gave the impact factor of each participant. From this we defined the following variables:

1. The activity of the group, or the number of electronic mailings per day.
2. The index of participation, the percentage of subscribers on each list that posted to the list during the observation period.
3. The percentage of those participants that had articles published in 1995.
4. The IFa of the published authors, that is the sum of the individual impact factors of the various articles divided by the number of authors.

5. The IFa per participant (IFp), that is the sum of the individual impact factor of the published authors posting messages divided by the total number of people posting messages whether published authors or not.
6. The IFa per posting (IFe), which was calculated by the sum of the individual impact factors of participants in the discussions multiplied by the number of postings of each individual. This sum was then divided by the total number of postings during the period of observation.
7. Finally, the Yield Index of the group which is calculated by multiplying the IFe by the number of postings generated each day during the period of observation.

We also analyzed the number of postings each group member sent. This allowed us to assess which participants carried the weight of the discussions in each list and what their reputation was in terms of published articles.

Finally, a selected subset of journals specializing in pediatrics was contrasted with the mailing lists on the Internet. The journals selected were published in the same months as those in which we monitored the mailing lists. These journals were:

1. *Journal of Pediatric Surgery*, April 1996.
2. *Journal of Pediatrics*, January, February, March 1996 (the section on Neonatal and Fetal Medicine).
3. *Pediatric Nephrology*, April 1996.
4. *Journal of the American College of Cardiology*, February, April 1996 (the section on pediatric cardiology).
5. *Journal of Child Neurology*, May 1996.
6. *Pediatric Pulmonology*, December 1995.

The original articles and short communications from each journal were analyzed. The first authors were searched in Medline and their publications in 1995 were evaluated in terms of their impact factors in the Science Citation Index as mentioned above. The individual impact factor for each first author was calculated and their sum divided by the number of articles analyzed gave a coefficient for each publication. This coefficient was contrasted with the IPQ of the lists, and also with the IFa per participant (IFp) on the lists on the Internet.

Statistical analysis was performed with the Statistica software (Statsoft Inc, Tulsa, OK, 1994).

RESULTS

We reviewed an extensive list of electronic-mail discussion groups that centered their discussions on pediatrics and related topics (Table 1). From this list we then selected those professional and unmoderated groups that were principally concerned with pediatric specialties, and which had comparatively easy access. As some of them (PEDIHEART, NICU-NET, PICU) were restricted, we first sent an electronic mail to the coordinators to gain access. The resulting list was centered on twelve mailing lists (Table 1, in italics).

Table 2 shows the data concerned with the potential of the lists. The most popular lists, which had most subscribers, were NICU-NET and PICU (1889 and 1197, on June and April 1996, respectively). Those with the highest percentage of published authors for 1995 among subscribers were PEDPATH and PEDIHEART (28%). When the quality of their articles was considered, the lists with the highest potential quality based on their IPQ were also PEDPATH and PEDIHEART (2.9 and 1.4, respectively). No significant correlations among the indexes were found.

The study of postings in the mailing lists generated the data shown in Table 3. The average observation period was 43.8 days (range, 22 to 86). The most active lists were NICU-NET and PICU, with 12 and 10.75 postings per day, respectively (data not

TABLE 1. Some Pediatric Mailing Lists on the Internet*

A.—ADOLESCENCE
 *SAM-L SAM-L@UCONNV.M.EDU
 Society for Adolescent Medicine—Adolescent Health Discussion

B.—PATHOLOGY
 *PEDPATH
 For subscription: subscribe pedpath (your name) to listproc@u.washington.edu

C.—CARDIOLOGY
 *PEDIHEART
 For subscription: subscribe pediheart to Listproc@medisun.ucsfresno.edu
 List-adress: heart@medisun.ucsfresno.edu
 *pdheart pdheart@revco.med.yale.edu
 For parent support of children who have heart disease.
 For subscription: send E-mail to revco@revco.med.yale.edu

D.—PEDIATRIC SURGERY
 *PESURG-L
 For subscription: subscribe pedsurg-l to Majordomo@umdnj.edu

E.—GASTROENTEROLOGY
 *CELIAC CELIAC@SJUVM.STJOHNS.EDU
 Celiac/Coeliac Wheat/Gluten-Free List (not essentially for professionals, but also for affected people and their families).
 Also in Web: <http://www.fastlane.net/homepages/thodge/archive.htm>

*CEL-PRO
 Celiac/Professional list (restricted)
 For subscription, send E-mail to mjonas@digital.net

*CYSTIC-L CYSTIC-L@YALEVM.CIS.YALE.EDU
 Support-group for people with Cystic Fibrosis and their friends, families, and health-care providers. Also in Web: <http://www.ai.mit.edu/people/mernst/cf/cystic-l/join.html>

F.—GENETICS
 *DOWN-SYN DOWN-SYN@VM1.NODAK.EDU
 Down syndrome. For families of affected people.

G.—NEPHRO-UROLOGY
 *ENURESIS ENURESIS@SJUVM.STJOHNS.EDU
 Enuresis Support and Information Group (ESIG), not only for medicine-related professionals but also for affected people.

*PEDNEFRO-L
 For subscription: subscribe pednefro-1 (your name) to listserv@lfmotol.cuni.cz
 Pediatric Nephrology (Czech Rep.)
 Also in Web: <http://www.lf2.cuni.cz/pn.html>

*PEDNEPH
 For subscription: subscribe pedneph (your name) to pedneph-request@bio-3.bsd.uchicago.edu
 Pediatric Nephrology (US)

*Peds-Urology peds-urology@peds-lists.bsd.uchicago.edu
 For subscription: subscribe peds-urology (Your Name) to macjordomo@peds-lists.bsd.uchicago.edu
 Also in Web: <http://peds-www.bsd.uchicago.edu/lists/urologysub.html>

H.—NEONATOLOGY
 *LACTNET LACTNET@LIBRARY.UMMED.EDU
 Lactation Information and Discussion

*NICU-NET
 For subscription: subscribe nicu-net (your name) to Listproc@u.washington.edu
 Neonatology

*PREEMIE-L preemie-1@vicnet.net.au
 Supporting list for preemies parents
 For subscription: subscribe PREEMIE-L (your e-mail address) to majordomo@vicnet.net.au
 Also in WEB: <http://www.vicnet.net.au/~garyh/preemie.htm>

I.—PULMONOLOGY
 *CYSTIC-L CYSTIC-L@YALEVM.CIS.YALE.EDU
 CYSTIC-L Cystic Fibrosis Discussion/Support
 See above

*PED-LUNG
 For subscription: subscribe ped-lung to majordomo@unixg.ubc.ca

J.—NEUROLOGY/NEUROSURGERY/REHABILITATION
 *C-PALSY C-PALSY@SJUVM.STJOHNS.EDU
 St. John's University Cerebral Palsy List (for affected people and their families)
 Also in Web: http://www.teleport.com/~gimlimp/htm/c_palsy.htm

*CSHCN-L CSHCN-L@NERVM.NERDC.UFL.EDU
 Children with Special Health Care Needs (not only professionals, but also parents and families of affected people)

TABLE 1. Continued

*DADVOCAT DADVOCAT@UKCC.UKY.EDU
 Parents of Children with Disabilities

*CHILD-NEURO
 For subscription: subscribe child-neuro (your name) to Listserv@waisman.wisc.edu
 Also in Web: <http://www.familyvillage.wisc.edu/child-neuro/Cn-list.html>

*HIJOS-ESP LISTSERV@LISTSERV.REDIRIS.ES
 Cerebral palsy. For parents of affected people. In Spanish.

*TSCTALK
 Tuberosus Sclerosis. For families and affected people.
 For subscription: subscribe tsctalk to majordomo@aura.title14.com
 Also in Web: <http://www.title14.com/tsctalk/index.shtml>

K.—OPHTHALMOLOGY
 *PED-OPHTH
 For information: send e-mail to dgranet@ucsd.edu

L.—OTORHYNOLARYNGOLOGY
 *PEDI-OTO
 For subscription, subscribe pedi-oto (your name) to listserv@listserv.bcm.tmc.edu

M.—CHILD PSYCHIATRY/GENERAL PEDIATRICS
 *AUTISM AUTISM@SJUVM.STJOHNS.EDU
 SJU Autism and Developmental Disabilities List (for families of affected people)

*AUTINET
 For subscription: Subscribe (in Subject field) to AUTINET-REQUEST@IOL.IE
 Autism Forum (restricted access).

*BEHAVIOR BEHAVIOR@ASUVM.INRE.ASU.EDU
 Behavioral and Emotional Disorders in Children (for families and parents of affected children)

*CHILD-PSYCH CAPSYCH@SJUVM.STJOHNS.EDU
 Child Psychology

*PEDIATRIC-SLEEP PEDSLEEP@VM.TAU.AC.IL
 Pediatric Sleep List (moderated)

*YANX-DEP YANX-DEP@SJUVM.STJOHNS.EDU
 Child and Adolescent Anxiety and Depression Forum (behavioral therapies and psychology)

*PEDIINFO
 Pediatric Informatics Mailing List
 For information, "information pedinfo" to listproc@u.washington.edu
 Also in Web: <http://www.uab.edu/pedinfo/ListInfo.html>

N.—EMERGENCY/CRITICAL CARE/ANESTHESIOLOGY
 *PED-EM-L PED-EM-L@BROWNV.M.BROWN.EDU
 Pediatric Emergency Medicine Discussion List
 For subscription: subscribe ped-em-l (your name) to listserv@brownvm.brown.edu
 Also in Web: http://www.brown.edu/Administration/Emergency_Medicine/ped-em-l.html

*PICU
 For subscription: subscribe picu (your name) to listproc@its.mccw.edu
 Also in Web: http://pedscm.wustl.edu/PICU-L/PCCM_list_info.html

*PAC macjordomo@sickkids.on.ca
 Pediatric anesthesiology
 For subscription: subscribe pac-digest to majordomo@sickkids.on.ca

*PEDIATRIC-PAIN
 Pediatric pain
 For subscription: subscribe pediatric-pain to mailserv@ac.dal.ca

* More extensive lists available at http://www.social.com/health/mlists.html#mailing_lists; <http://www.liszt.com>; <http://www.tile.net/tile/listserv/index.html>; and <http://www.med.jhu.edu/peds/neonatology/poi.html>. Some lists are for medicine-related professionals. The groups for parents and affected people are specified. URLs' of some mailing lists Web sites are provided. In italics we show the twelve mailing lists included in the study. To subscribe a list send E-mail to LISTSERV@LISTSERV.NET with a single line message: Subscribe (list name), unless otherwise specified.

shown). The most participative ones were CHILD-NEURO, PED-LUNG, PEDPATH, and PEDIHEART (17%, 16%, 14%, and 14% of subscribers, respective-

TABLE 2. Potential of the Lists*

	Subscribers (sample)	Published Authors (%)	NA (%)	IPQ
PICU	1197 (90)	15	8	0.4
PEDPATH	155 (81)	28	12	2.9
NICU-NET	1889 (287)	16	16	0.4
PEDI-OTO	150 (64)	26	29	0.5
CHILD-NEURO	506 (228)	21	23	0.8
PED-EM-L	658 (141)	11	11	0.2
PED-LUNG	168 (148)	18	27	0.6
PEDNEFRO-L	113 (107)	18	9	0.8
PEDS-UROLOGY	503 (179)	14	21	0.4
PEDIHEART	812 (294)	28	11	1.4
PED-SURG-L	208 (165)	20	23	0.7

Abbreviations used are: NA, data not available; IPQ, Index of Potential Quality, or average impact factor among the sample of subscribers; PEDNEPH, data not available.

* PED-PATH and PEDI-HEART subscribers had the highest average impact factor.

TABLE 3. Study of Postings on the Lists*

	Observation Period (days)	Activity†	Participation (%)	Participants Who Published in 1995 (%)	IF per participant (IFp)	Yield Index (YI)
PICU	28	+++	12	11	0.2	3.1
PEDPATH	28	+	14	23	2.4	2.7
NICU-NET	22	+++	8	11	0.2	1.9
PEDI-OTO	27	+	7	18	0.1	0.1
CHILD-NEURO	28	++	17	29	2.0	11.0
PEDNEPH	86	+	—	20	0.9	1.6
PED-EM-L	41	+	9	8	0.2	1.0
PED-LUNG	79	+	16	18	1.0	0.3
PEDNEFRO-L	79	+	7	25	0.7	0.2
PEDS-UROLOGY	28	+	1.6	25	0.6	1.1
PEDIHEART	45	++	14	13	1.1	5.9
PED-SURG-L	35	+	6.7	14	0.1	0.2

* PEDPATH and CHILD-NEURO had the highest average impact factor among subscribers who posted (IFp). CHILD-NEURO had the best combination of high activity and high standing among who posted (YI).

† Activity: +, ++, and +++, means less than four, four to ten, and ten or more postings per day, respectively. PEDNEPH, list of subscribers not available.

ly). The one which showed the highest percentage of published authors who actively participated in discussions was CHILD-NEURO (29%). PEDPATH (IFA 10.5) and PEDIHEART (9.0) members had the best average quality publications (data not shown). The highest IFa of the active participants in the mailing lists (IFp), were found in PEDPATH and CHILD-NEURO (2.4 and 2.0, respectively). PEDPATH and CHILD-NEURO rated the highest average IFe, 2.7 and 2.1, respectively (data not shown). CHILD-NEURO and PEDIHEART had the highest yield (Yield Index, 11.0 and 6.0, respectively), that is to say they had on average many postings by published authors with high impact factors.

When the IPQ of the lists was contrasted with the average IFp in the discussions (IFp), one can generally note a certain similarity, but on occasion the IPQs are slightly greater (Fig 1). Exceptional cases are CHILD-NEURO and PED-LUNG, with an apparently better average quality among their participants than among their subscribers (IFp = 2.0 vs IPQ = .8, and IFp = 1.0 vs IPQ = .6, respectively). The opposite cases, that is much higher quality in their subscribers than in their participants, are PED-SURG-L (IPQ = .7 vs IFp = .1), PEDI-OTO (IPQ = .5 vs IFp = .1), PICU (IPQ = .4 vs IFp = .2) and NICU-NET (IPQ = .4 vs IFp = .2).

In addition, the subscribers of each mailing list who participated in discussions during the observa-

tion period were grouped according to the number of postings they sent to the lists. The average IFp was then calculated as a function of the postings per participants (Fig 2). In general, the higher the postings per participant the higher the IFp.

The data from the analysis of the journals of pediatric specialties are shown in Table 4. The journal with the best IFa per first author was the section of pediatric cardiology from the *Journal of the American College of Cardiology* (5.3). Except for *Pediatric Pulmonology* the rest of the publications showed a high index (range, 40 to 50%) of first authors who published in 1995. The IFa per first author of the journals was higher than the IFp of the corresponding mailing list in all cases, but CHILD-NEURO reached an impact factor similar or higher than some of the journals (Fig 3).

DISCUSSION

We conclude that the most popular and active list is NICU-NET. Those that have authors with the greatest standing among the subscribers, are PEDPATH and PEDIHEART. PEDPATH and CHILD-NEURO have the highest quality per posting. Finally, CHILD-NEURO provides the highest yield, that is a high quality with a high activity.

Some interesting findings arise when we contrast the potential quality of the subscribers of a list (IPQ, average IF per subscriber) and the postings (IFp,

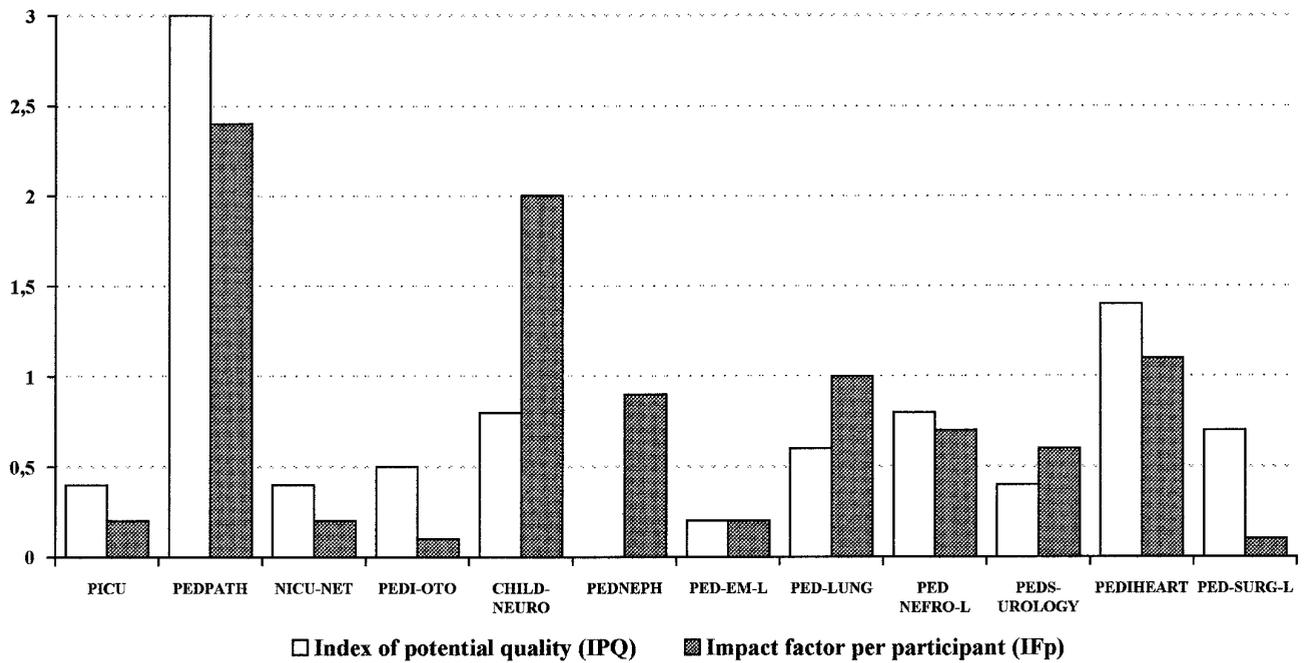


Fig 1. IPQ of the lists versus IFa among participants (IFp) in the postings. CHILD-NEURO and PED-LUNG improved their potential quality (IFp much higher than IPQ). PEDI-OTO and PED-SURG-L showed IFp much lesser than IPQ. PEDNEPH, data not available in the study of subscribers.

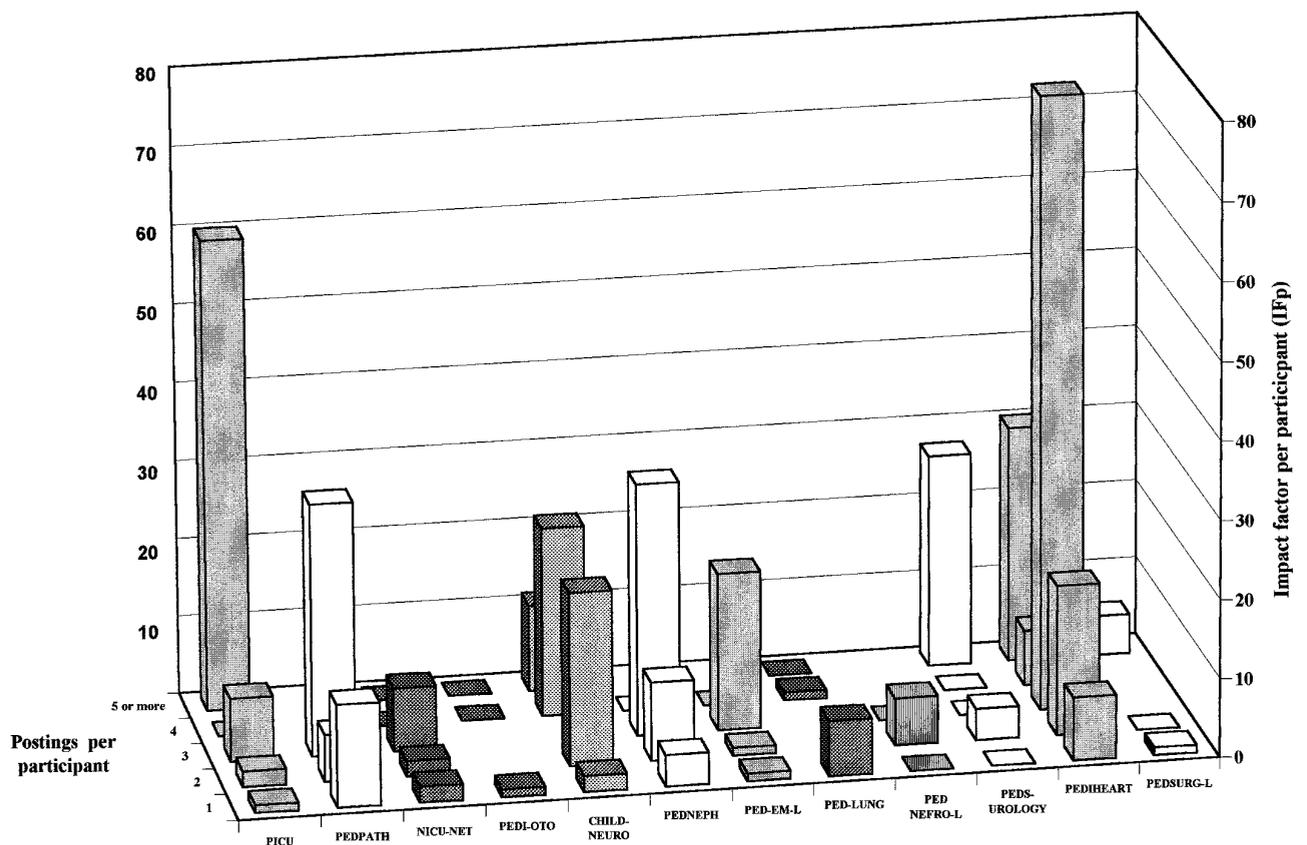


Fig 2. Distribution of average IFp in each mailing list per number of postings per participant. In some lists (PICU, PEDS-UROLOGY) discussions were held by few of members with high publishing standing; others showed more uniform participation (PEDPATH, CHILD-NEURO).

average IF per participant) (Fig 1). CHILD-NEURO and PED-LUNG showed much higher IFp than their IPQ, that is real quality much higher than potential quality. This may be attributed to an underestima-

tion of the IPQ because 23% and 27% of the subscribers, respectively, were not identified (Table 2). Similarly, this may be the reason to explain why PED-SURG-L and PEDI-OTO showed such a low IFp

TABLE 4. Reviewed Pediatric Journals*

	Number of Articles Reviewed	Published Authors (%)	Average Impact Factor Per First Author
<i>Journal of Pediatric Surgery</i>	28	50	1.7
<i>Journal of Pediatrics (Neonatal)</i>	13	46	1.8
<i>Pediatric Nephrology</i>	27	48	2.5
<i>Journal of Child Neurology</i>	21	47	3.3
<i>Journal of the American College of Cardiology (Pediatric Cardiology)</i>	5	40	5.3
<i>Pediatric Pulmonology</i>	12	16	1.4

* High percentages of the first authors had published papers on the last year.

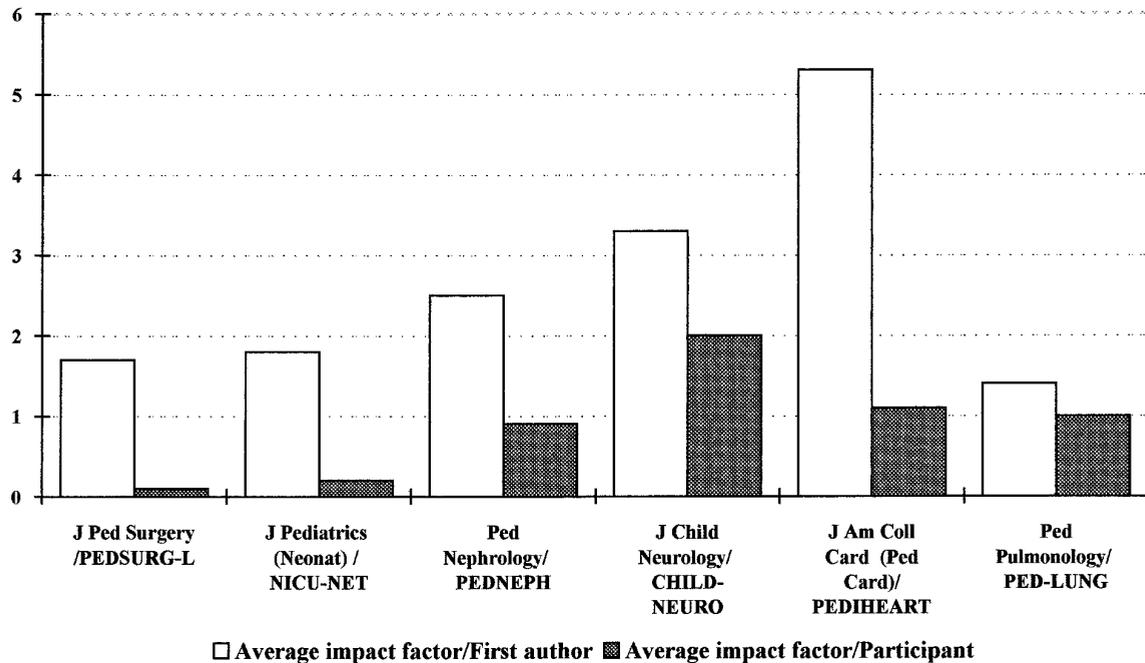


Fig 3. Comparison of IFa among the lists and the pediatric journals. All the journals had a higher IFa among their first authors than the average impact factors of the participants on the corresponding mailing list. Nevertheless, CHILD-NEURO rated a higher value than some of the journals.

as regards to their IPQ (0.1 vs .7, and .1 vs .5, respectively). In fact, 23% and 29% of their subscribers, respectively, were not identified. PICU and NICU-NET showed very low IFp compared with their IPQ despite their low percentages of not available data in the study of potential. This could be interpreted as a result of the higher participation of nurses and other health professionals with low publishing capacity in these lists (28% of members in NICU-NET are not physicians),⁷ or the unequal participation of members in on-line interventions.

The number of postings that each participant sent to the discussions per IFa in each group, was the variable created to know if more active subscribers necessarily had higher impact factor as published authors. From the data we conclude that on some lists published authors with high impact factor often posted messages which had a significant effect on the global impact factor of the list (eg, PICU and PEDS-UROLOGY). However, in other lists the participation was more uniformly shared (eg, PEDPATH, CHILD-NEURO, PEDNEPH, and PEDIHEART), that is to say people with high standing as authors contributed relatively little in comparison with others of lesser recognized standing.

Clearly the introduction of the Internet into the world of science brings with it a series of advantages because it allows both an exchange of ideas and knowledge, and also a greater speed of communication and easier access worldwide. A recent case exemplifies these advantages. In Haiti, when a batch of locally produced acetaminophen was contaminated with diethylene glycol, various children were intoxicated and several of them died. This fact was made known on PEDNEPH and allowed a rapid intervention of pediatric nephrology departments of various United States centers which proved vital in the ensuing evacuation of these children with renal failure. They were provided with hemodialysis in United States hospitals apart from facilitating a rapid etiological diagnosis and the identification of the toxic agent. The first published recognition of the event appeared in the *New York Times* on 26th June but it had been made known on PEDNEPH by 17th June.

Moreover, this is achieved at a lower cost because it eliminates time consumed on printing, transport, and distribution. We are on the threshold of a new era of information exchange in medicine which may impact the relationship and mode of contact between physician scientists, the role of biomedical publica-

tions, and the very way in which medicine is taught.¹¹ Some authors have pointed out the necessity of rethinking the role that biomedical journals should have before such publications “die a natural death” and, bearing this in mind, many journals already offer partial or complete electronic versions,¹² or even articles not available on the written edition (eg, *Pediatrics electronic pages*, <http://www.pediatrics.org>). Finally others question whether mailing lists are, in fact, the ideal forums for the interchange of medical information or whether they are useful sources of information for those who practice medicine.²

To date we are not aware of previous studies dealing with the quality of various forums of medical discussions on the Internet. Hence, the different quality indexes used in the present study are open to certain dispute. However, they are based on the accumulation of defined impact factors generated by the published articles of the various members of the discussion groups, a way for any scientific group to gain prestige in a given field of science. For this reason we have deemed it useful to assess the quality of Internet resources in other fields of study. Finally, we accept that the comparison of the coefficients that were obtained from the analysis of certain journals may be open to different interpretations.

It is important to emphasize that by no means this study suggests that a three-month subscription to CHILD-NEURO would yield more than one issue of the *Journal of Pediatric Surgery* or of *Pediatric Pulmonology*. On the contrary our data suggest that just as the live exchanges of knowledge through direct, person-to-person contact or by attending scientific congresses serve as a recognized way of enriching our knowledge, so should this new way of exchanging

scientific information from personal computer to personal computer be respected and encouraged as a powerful, innovative, and successful complementary method.

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