

# Court evidence via video conferencing by doctors: Savings of time, money and energy

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## ABSTRACT

**Background.** Doctors are called to courts to give evidence as experts. This is time-consuming and impedes routine patient care. The court ordered the state to instal a video conferencing system for the benefit of doctors in hospitals for this purpose. We aimed to quantify the costs and benefits of the video conferencing system for doctors to give evidence as expert witness in courts.

**Methods.** We analysed the tele-evidence system at our institution from the societal point of view examining whether the arrangements were positive for the taxpayers and second from the point of view of a cost–break-even analysis.

**Results.** Over a period of 1 year, 482 tele-evidences were recorded from our site. Most of the doctors appearing for court evidence were males (84%) and the majority were in government health services (84.4%). These expert witnesses included specialists (83.8%), followed by super-specialists (10.4%) and non-specialists (5.8%). The subject experts who were called the most were radiologists (19.5%), forensic experts (18.3%), surgeons (18.0%), orthopaedic surgeons (12.4%) and neurosurgeons (6.6%). Average savings per tele-evidence were ₹2620; 181 km of travel was prevented and 4 hours and 12 minutes of time was saved.

**Conclusions.** Given our limited resources, video conferencing saves costs, time and travel.

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## INTRODUCTION

A virtual court or e-courthouse is the concept of a judicial forum that has no physical presence but still provides the same judicial services that are available in courtrooms. The future of courts is greatly dependent on technology and how technology can improve their functioning.<sup>1</sup> Video conferencing is being used in courts in many countries such as Australia, Brazil, Europe, Kenya, Russia, South Africa, the UK and the USA.<sup>2–8</sup>

The Indian e-courts project was conceptualized on the basis of the ‘National Policy and Action Plan for Implementation of Information and Communication Technology (ICT) in the Indian

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Judiciary–2005’ submitted by the e-Committee of the Supreme Court of India with a vision to transform the Indian judiciary by enabling courts using ICT. Phase 1 involved computerization of the courts, and in phase 2, all court complexes were to be connected with video conferencing. The Supreme Court of India observed that video conferencing is an advancement of science and technology which permits seeing, hearing and talking with someone who is not physically present at the same facility but with the same ease as if they were physically present. The legal requirement for the presence of the witness does not mean actual physical presence. The court allowed the examination of a witness through video conferencing. Further, in the same decision, it has observed that in cases where the attendance of a witness cannot be procured without an amount of delay, expense or inconvenience, the court could consider issuing an order to record the evidence by way of video conferencing. The courts were asked to use video conferencing facility in divorce, custody and other matrimonial cases. Detailed guidelines have been issued to all states regarding video conferencing.<sup>9–15</sup>

In India, tele-evidence facilities were made available for doctors in the states of Punjab, Haryana and Chandigarh, on the orders of the Punjab and Haryana High Court. Initially, from 2013, the facility was available only at the District Secretariat; thereafter, the infrastructure was installed at a few medical colleges in 2015. In 2017, all the district hospitals and medical colleges were provided with video conferencing facilities.

In a case of medical negligence, the Supreme Court went a step further and admitted in evidence the recording of testimonies and cross-examination of foreign expert witnesses through internet conferencing (Skype) instead of video conferencing.<sup>16</sup>

We evaluated a real-time, interactive, audio, video link between Government Medical College, Patiala, and courts and jails video conferencing (vC) system via the National Informatics Centre and State (Punjab) Wide Area Network (SWAN/PAWAN) at various courts in the states of Punjab and Haryana. The analysis focused on a single tele-evidence installation and evaluated the use of this link versus face-to-face system from the doctors’, courts’ and society’s point of view.

## METHODS

There are two types of tele-evidence systems currently available for doctors in Punjab and Haryana, the so-called hard vC and soft vC. The soft vC system uses Windows®-based personal computer (laptop or desktop) or an android-based mobile device (phone) with communication via the software ‘Vidyo’ over public internet and existing general purpose IP (internet protocol) networks. The hard vC uses the Polycom® (HDX7000)

video conferencing system with a high-definition camera, microphone, remote controller, liquid crystal display (LCD) units and uninterrupted power supply (UPS) with batteries with communication over secure dedicated state network.

A cost-benefit analysis was done by comparing the cost of attending court evidence personally with that via tele-evidence. A detailed log of all the court evidence of doctors held via video conference was maintained from April 2016 to March 2017. It included the date of evidence, place/location of court, gender of doctor, type of practice, speciality of doctor, rank/designation of the witness and postponements, record of use of electricity, internet/phone bills and maintenance of equipment.

The benefits from the tele-evidence system include potential savings in terms of time, cost, travel and reduction in pollution and greenhouse gas emissions. Costs incurred on the tele-evidence system include the cost of purchase of the equipment, operating costs of telephone/internet, maintenance/service and personnel. Start-up costs such as those associated with initial evaluation, purchase and training were excluded. However, the purchase price of the equipment was amortized over its projected useful life. In the case of postponements, travel was totally avoided which would have to be undertaken and information on adjournment received on reaching the court. Data on transportation costs were estimated for each round trip, which includes travelling allowance at the rate of ₹6/km and daily allowance at the rate of ₹200/day. Clinical medical expertise savings were estimated from rank/designation, average salary and travelling time. This was deduced from indirect costs related to the clinicians' absence from the workplace, anticipated continuity of care and prevention of loss of clinical services to the patients/public, as the doctors were able to return immediately to their clinics.

No estimate could be made for conduct money, journey day, record collection time and waiting time. No additional estimate could be made for avoided perceived safety concerns, frustration, harassment, breakdowns and stress. Further, the value of a life saved by a clinician was not estimated. Inclement weather and accidents also add to the difficulty of transportation.

## RESULTS

The facility for video conferencing for court evidence of doctors was installed in our institution in November 2015, although the system was received in the department in 2014. Initially, the system was used only by doctors of the department; but

thereafter, all doctors of the institution, medical officers of the surrounding areas and private practitioners of the city were using the facility for court evidence as expert witness. The system is being used for tele-evidence to courts in other cities in the states of Punjab and Haryana. Local courts evidence was not taken up due to close proximity, large number and limited infrastructure.

The system is installed in the faculty room of the department and is managed by the two lead authors. A detailed logbook is kept for record purposes. Similar systems (Hard vC) are also working at Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh and Government Medical College and Hospital (GMCH), Chandigarh, but with better facilities and extra staff. The Soft vC (Vidyo) system is being regularly used by a private medical college in Haryana and occasionally by doctors who previously worked in Punjab/Haryana but are now working elsewhere (Jammu and Kashmir, Uttarakhand and Uttar Pradesh).

Over the period of 1 year, tele-evidence was recorded 482 times from our site (Table I). Only 19 (3.8%) times was the recording of evidence postponed due to signal or electricity failure on either side. Apart from these, there were 86 postponements (about 1:6) due to various other reasons.

In fewer than 10 instances doctors were directed to appear in person, usually at the request of the public prosecutor, for want of some documents on the court file. A couple of cases were reported where the district courts had to be prodded initially by the High Court to get accustomed to the technology. In none of the cases, dealt by the authors themselves, the cross-examination was found wanting or unacceptable by the courts or the defence. The keen interest and involvement of judicial officers in the proceedings via video conferencing was appreciable.

The recording of evidence using ICT has been increasing over the year, with the maximum being just after winters in March (13.9%) and then after court vacations in September (13.5%). Most of the doctors appearing for court evidence were male (84%) and the majority were in government health services (84.4%). These expert witnesses included specialists (83.8%), followed by super-specialists (10.4%) and non-specialists (5.8%). The subject experts who were called the most were radiologists (19.5%), forensic experts (18.3%), surgeons (18.0%), orthopaedic surgeons (12.4%) and neurosurgeons (6.6%; Table II).

As the majority of tele-evidence operating costs are fixed,

TABLE I. Month-wise distribution of tele-evidences according to gender and type of practice

Month, year	Number of tele-evidences, <i>n</i> (%)	Gender of the doctor		Type of practice	
		Male, <i>n</i> (%)	Female, <i>n</i> (%)	Government, <i>n</i> (%)	Private, <i>n</i> (%)
April 2016	24 (5.0)	22 (91.7)	2 (8.3)	18 (75.0)	6 (25.0)
May 2016	32 (6.6)	29 (90.6)	3 (9.4)	31 (96.9)	1 (3.1)
June 2016	20 (4.1)	18 (90.0)	2 (10.0)	18 (90.0)	2 (10.0)
July 2016	43 (8.9)	40 (93.0)	3 (7.0)	25 (58.1)	18 (41.9)
August 2016	22 (4.6)	8 (36.4)	14 (63.6)	18 (81.8)	4 (18.2)
September 2016	65 (13.5)	58 (89.2)	7 (10.8)	55 (84.6)	10 (15.4)
October 2016	53 (11.0)	45 (84.9)	8 (15.1)	48 (90.6)	5 (9.4)
November 2016	31 (6.4)	27 (87.1)	4 (12.9)	27 (87.1)	4 (12.9)
December 2016	36 (7.5)	34 (94.4)	2 (5.6)	32 (88.9)	4 (11.1)
January 2017	39 (8.1)	32 (82.1)	7 (17.9)	34 (87.2)	5 (12.8)
February 2017	50 (10.4)	38 (76.0)	12 (24.0)	45 (90.0)	5 (10.0)
March 2017	67 (13.9)	54 (80.6)	13 (19.4)	56 (83.6)	11 (16.4)
Total	482 (100.0)	405 (84.0)	77 (16.0)	407 (84.4)	75 (15.6)

greater utilization of the system should further reduce the unit cost and increase total savings. Furthermore, the payback, or the time it takes to recover the initial investment, should get reduced. The travel costs were calculated as per the location of the courts in the state and the distance to be travelled thereof (Table III). Assuming the potential annual savings of ₹1 263 000 and given an initial investment of about ₹500 000 for equipment and installation, the expected time to recover the initial investment was <6 months (Table IV). The benefit in terms of carbon footprint (Table V) was also estimated. The average saving per tele-evidence recorded was ₹2620, 181 km of travel was prevented and there was a time-saving of 4 hours and 12 minutes (Table VI).

## DISCUSSION

Our findings highlight the savings achieved with a tele-evidence system. Use of tele-evidence led to potential savings of time, money and energy, apart from environmental benefits and better medical services.

Today, many physicians seem reluctant to examine or treat cases of injury or disease, which are likely later to become the basis of a claim or litigation in the courts. A physician, who stands high in his/her profession and whose opinion and impartiality is often of great value, shuns this important responsibility. If the physician knows that he/she may be called as a witness in a court or compensation proceeding, he/she immediately envisions the situations that are likely to confront him/her. He/she sees himself/herself forced to cancel a full schedule of office and hospital appointments because of a call to appear in court or at a hearing. He/she hurries down to court and then spends hours standing around waiting to be put on the stand. He/she goes through the ordeal of giving testimony

before a group of laymen who lack the background necessary to understand his/her scientific explanations.<sup>17</sup>

Technologies such as video conferencing need to be evaluated in terms of four key performance measures: time expenditure, volume of matters, administrative and procedural adjustments and the nature of the equipment. A technology that can be incorporated into existing procedures is less disruptive and more likely to be well-received.<sup>18</sup>

A standard closed-circuit configuration between a court and a holding institution requires equipment set-up in a designated room in the holding institution which affords the witness, privacy and quiet. The introduction of change into any organization is a difficult venture. Court use of technology is a complex undertaking, and although neither an automatic solution to the financial and time demands placed on participants nor the cost and delay problems of the courts, some technologies do provide suitable and in some instances superior methods of handling legal matters.<sup>18</sup> The increase in efficiency of judicial time, the cost savings, and the additional advantages, more than outweigh the disadvantages.<sup>19</sup>

To improve efficiency in court procedures, the American Bar Association recommended increased use of audiovisual technology, such as telephone and live video communication, to eliminate delays caused by non-availability of participants in both civil and criminal procedures. The option to testify by audiovisual technology provides savings in precious clinical time for clinicians in public facilities.<sup>20</sup> An Australian study reported that video conferencing can provide timely, expert advice to courts in remote and rural areas, with considerable saving in both costs and humanitarian values.<sup>21,22</sup> The American Psychiatric Association concluded that telepsychiatry is appropriate for commitment and for conducting hearings. The telecourt experience has led to major savings in staff time and productivity, improved patient safety, eliminated elopement, decreased hospital's liability risk, abolished transport, preserved the dignity of the patient, prevented wasted time in the courthouse and provided a comfortable atmosphere for the expert, as well as financial health of the medical centre although some attorneys had been hesitant to use the new system.<sup>23-25</sup> The video conference technology to capture the testimony of remote trial witnesses raises complex legal issues; still, it has been used widely in the USA in state and federal civil cases but questioned nevertheless in view of the Confrontation Clause, Craig's Test and the exceptional circumstances test.<sup>2,26-29</sup>

The legal fraternity is often frustrated by the expense and practical difficulties of bringing injured or infirm clients and geographically distant witnesses into court proceedings. Latest advances and cost reductions in computer and communication technologies make it feasible to present 'virtual' plaintiffs and witnesses in court. Video conferencing, which sends two-way audio and video signals over high-speed communication lines, makes it possible for attorneys and judges to fully interact with people at remote locations as if they were in the courtroom. This happens in the full view and hearing of the jury. Video conferencing uses traditional television technology to transmit live signals between the sites. Each location is equipped with cameras, microphones, monitors, speakers and computers. Sites are connected using digital telephone lines. Practical guidelines and considerations for using video conferencing in bringing a witness to court without the time and expense of travel are necessitated.<sup>12,30,31</sup>

Scientists, especially doctors are generally untutored and

TABLE II. Tele-evidence according to specialty of the expert witness

Specialty of expert witness	Tele-evidence, <i>n</i> (%)
<i>Specialists</i>	404 (83.8)
Radiodiagnosis	94 (19.5)
Forensic medicine	88 (18.3)
General surgery	87 (18.0)
Orthopaedics	60 (12.4)
Otorhinolaryngology	28 (5.8)
Internal medicine	13 (2.7)
Obstetrics and gynaecology	8 (1.7)
Ophthalmology	7 (1.5)
Paediatrics	6 (1.2)
Dermatology	3 (0.6)
Anaesthesia	3 (0.6)
Pathology	3 (0.6)
Psychiatry	2 (0.4)
Chest and respiratory medicine	1 (0.2)
Pharmacology	1 (0.2)
<i>Super-specialists</i>	50 (10.4)
Neurosurgery	32 (6.6)
Cardiology	6 (1.2)
Urology	6 (1.2)
Plastic surgery	3 (0.6)
Endocrinology	2 (0.4)
Neurology	1 (0.2)
<i>Non-specialists</i>	28 (5.8)
Medical officers	24 (5.0)
Medical records office	4 (0.8)
Total	482 (100.0)

TABLE III. Tele-evidence distribution according to location and distance of the courts and estimates of cost savings on travel in terms of time and money

Location of court	Tele-evidence (E)	Distance from Patiala (km) (D)	Travelling allowance (@₹6/km)+ daily allowance (@₹200/day)	Approximate travelling and evidence duration (in minutes)
Sangrur	118	55	101 480	20 060
Samana	61	30	34 160	7320
Fatehgarh Sahib	46	50	36 800	7360
Kaithal	27	70	28 080	5400
Barnala	26	95	34 840	6500
Ludhiana	21	100	29 400	5460
Fazilka	21	250	67 200	11 760
Nabha	20	40	13 600	2800
Sunam	16	50	12 800	2560
Malerkotla	15	60	13 800	2700
Moonak	14	80	16 240	3080
Dhuri	12	65	11 760	2280
Mansa	11	105	16 060	2970
Gurdaspur	11	250	35 200	6160
Guhla	8	40	5440	1120
Bathinda	7	155	14 420	2590
Budhlada	6	110	9120	1680
Rajpura	6	30	3360	720
Ropar	6	85	7320	1380
Kharar	5	70	5200	1000
Ambala	4	50	3200	640
Mohali	4	65	3920	760
Jagraon	3	120	4920	900
Gurgaon	3	270	10 320	1800
Sirsa	3	175	6900	1230
Muktsar	2	205	5320	940
Dera Bassi	1	65	980	190
Abohar	1	230	2960	520
Faridkot	1	190	2480	440
Nawanshahr	1	105	1460	270
Kurukshetra	1	80	1160	220
Jagadhari	1	110	1520	280
Postponements	86	77	≈96 600	≈18 400
	482+86=568	= Σ(E*D*2) 87 400 km	= Σ(E*((D*2*6)+200)) ₹638 000	=Σ(E*((D*2)+60)) 121 490 minutes ≈253 working days

TABLE IV. Tele-evidences according to rank/designation of the doctor and estimates of the indirect cost of absence from clinical duties for public service

Designation	Tele-evidences, <i>n</i> (%)	Working days involved	Approximate remuneration per day (₹)	Approximate expertise (₹) total
Faculty	85 (17.6)	38	5000	190 000
Private	75 (5.0)	33	5000	165 000
Senior resident	161 (27.6)	72	3000	216 000
Medical officers	24 (33.4)	11	2200	24 200
Junior resident	137 (16.4)	61	1500	91 500
Postponements	86 ≈1:6	38		122 300
Total	482+86=568	253		809 000

psychologically unprepared for roles as expert witnesses until they learn through personal experience.<sup>32</sup> Some authors have lamented compulsory personal testification of medical evidence in the courts, wastage of time, disruption of clinical duties and sometimes unnecessary cross-examination in courts. Others have perceived problems related to travelling, undue time consumption, lack of work culture, waiting for record evidence, troubles in getting the expenses bill, repeated summons, added

stress, pending cross and frequent adjournments due to non-availability of judge/attorneys/accused, issue of summon by mistake, strikes by lawyers, non-availability of supplementary reports on record and fixing of next date before arrival.<sup>24,33-40</sup>

Many studies have done cost-benefit analysis of telemedicine with the expected time to recover the initial investment being 4-5 years. The most common benefits cited were improved security, personnel safety, costs savings, access to specialists,

TABLE V. Calculation of carbon footprint and the credits for environment protection

Carbon footprint*	Carbon credits (tons)
Equipment electricity usage	-0.24
Phone and internet usage	-0.27
Equipment usage	-1.74
Daily allowance saved	+1.59
Transport saved	+10.34
Transport depreciation saved	+1.00
<b>Total</b>	<b>+10.68</b>

\* [www.carbonfootprint.com/calculator.aspx](http://www.carbonfootprint.com/calculator.aspx)

TABLE VI. Cost-benefit analysis

Heads for analysis	Amount (₹)
<i>Benefit/savings</i>	
Travelling/daily allowance not paid	(+) 638 000
Clinical/public services time saved	(+) 809 000
Deemed value of carbon credits	(+) 6000
<i>Operating costs</i>	
Telephone/internet/electricity bill	(-) 40 000
Amortization/depreciation of equipment (approx.)	(-) 150 000
Staff (no extra staff available till date)	0
<b>Total potential annual savings</b>	<b>1 263 000</b>

Average net savings per tele-evidence ₹2620, 181 km, 4 hours and 12 minutes

savings in transportation, medical reimbursement and care delivery. The most common barriers cited were costs of technology, resistance from personnel, lack of staff technical expertise and difficulties coordinating services. Studies have also made assessment of savings in emissions<sup>7</sup> and a positive impact on pollution.<sup>41-51</sup>

Some studies have emphasized that via teleconferencing, it is difficult to reproduce the sense of sharing the same space (so-called realistic sense or effect of presence) even though cameras can give a better sense of agreement via gazes and facial orientations, the sweat on a witness's brow, the glint in his/her eye and the quiver of his/her lip.<sup>27,52</sup>

### Conclusions

A video conference is a major step forward for the efficiency and swiftness of justice, be it to better protect witnesses and victims, and facilitating interviews with experts, defendants and other users without requiring their physical presence in the court.

The Indian legal system has recognized video conferencing as an effective instrument to collect evidence as it avoids unnecessary adjournments of cases and also saves the litigants from costs borne on transportation and other inconveniences that may arise. Indian statutes do not have any specific provision for recording evidence through video conference and it is through landmark decisions that the judiciary has laid down the framework and parameters for the use of video conferencing facilities to record the evidence of the witness.

While courts have held that recording of evidence through video conferencing is permissible in law, they have also cautioned that necessary precautions must be taken, both as to the identity of the witnesses and accuracy of the equipment used for the purpose. The courts have also rejected all arguments about inferior video quality, disruption of the link and other technical issues.

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