A conversation including 39 questions with Anirban Basu

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Abstract
At the 2018 International Conference on Health Policy Statistics (ICHPS) held in Charleston, South Carolina, Anirban Basu was awarded the Mid-Career Excellence Award from the American Statistical Association Section on Health Policy Statistics (HPSS). Anirban was exceptionally and uniquely qualified for this award. Highlights include his providing outstanding service to the HPSS, advancing statistical methodology, advancing methodology in other domains of health policy, and performing extensive and highly impactful applied work in medicine and health care. In this interview, we trace Anirban’s upbringing, schooling, early career, and mid-career phases to gain insights into his success. We also sought his opinions on salient topics or issues.

Keywords Mid Career Excellence Award · Health Policy Statistics Section · American Statistical Association · International Conference on Health Policy Statistics · 2018

1 Introduction

The Mid-Career Excellence Award is eligible to persons who are within 15 years of their most significant degree. Having obtained his Ph.D. in 2004, Anirban met the eligibility criteria for the 2018 award. Anirban transition from Ph.D. student in 2004 to full professor in 2014, subsequently receiving a named and endowed full professorship in 2015. His is currently the Stergachis Family Endowed Professor, University of Washington, Seattle and Director of The Comparative Health Outcomes, Policy, and Economics (CHOICE) Institute.

His rapid rise is accompanied by a large number of awards, including student awards from the ASA for the 2003 JSM and from the HPSS for the 2003 ICHPS, a MDM comparative effectiveness award in 2009, three distinct awards from the International Society for Pharmacoeconomics and Outcomes Research (2007, 2009, 2016), and becoming an elected fellow if the ASA in 2016. He has also received multiple other awards, lectureships, invited
talks, and other honors. At the time of the award, he was approaching 100 publications and had several highly cited and in the most prestigious journals across multiple disciplines. It is clear that Anirban’s peers think extremely highly of his contributions to health policy statistics and its constituent disciplines.

His service work is meritorious. Anirban chaired the 2010 International Conference on Health Policy Statistics (ICHPS), was HPSS program chair for the Joint Statistical Meetings in 2008, and was a member of the planning or the advisory committee for four other ICHPS meetings. In addition, Anirban has chaired or co-chaired several other conferences of import to the HPSS, including the Society for Medical Decision Making (MDM) Annual Meeting in 2011 and was co-chair of its Scientific Committee in 2009 and 2010. He also founded the Annual Health Econometrics Workshop (AHEW) in 2009 and each year has chaired or otherwise overseen the conference. By being at the forefront of these conferences, Anirban has helped to strengthen the core constituency and dissemination of health policy, health services research, and outcomes research.

Anirban is also prodigious in his receipt of grants and generous in his commitment to grant review and editorial work. He is loved by his students, others whom he has mentored, and has a reputation for being a champion to junior investigators having helped mentor them through the arduous process of obtaining grants; at the time of submitting his nomination for the mid-career excellence award, he had advised or mentored 22 students or post-doctoral fellows. He has also established seminar series and research groups, and been instrumental in improving the curricula of the Pharmaceutical Outcomes Research and Policy Program that he has directed since 2015.

The reminder of this paper reports on a recent conversation with Anirban that covered both professional and fun topics. It hopes to provide insights into the reasons for his success and the development of the wonderful academic colleague we see today. Questions are in Roman font while Anirban’s responses are indicated by AB and are in italics.

2 Early life and schooling through to high school

Anirban Basu was born in a small town in the state of West Bengal in India (Fig. 1).

1. What did/do your parents do and how did they influence you?

   AB: Actually, both my parents hailed from the town in which I was born. Even though they supposedly had an arranged marriage, I always had my doubts whether it was really “arranged” 😊, my parents wouldn’t say otherwise. My mother is a homemaker and my father was a bank manager (now retired). I think the biggest influence they had on me is how they had complete faith in me that I would go well in life, even though, and they even admit now, I was often very goofy growing up.

2. What did you want to do when you grew up?

   AB: I honestly had no clue. Perhaps a cricketer 😊. I used to play cricket on the streets with other neighborhood kids quite often.

3. Did you think that one day you’d move to the US and become a famous professor?

   AB: Moving to US, yes but not until I was in my undergrad. As an undergrad in Pharmaceutical Engineering, I had recognized that option early on and was giving some serious time to my GRE prep. Professor, not so much until late in my PhD program. I was sure early on that I will join a consulting company.

4. Who did you look up to in those years generally and professionally?
AB: Growing up, it was Steffi Graf, Andre Agassi (and who knew they would hook up!), Kapil Dev (a famous cricketer) and Amitabh Bachchan (famous Bollywood actor). Not sure if I had any professional idol until I started graduate school.

5. What sports and other activities did you like?
AB: I used to play cricket and badminton. Followed soccer passionately.

India has a rich heritage in cricket. Were you a fan? Who were your favorite players? Who played in your local team?

AB: Of course I will get this question from a Kiwi! I was a big fan and played the sport a lot. Obviously I used like a lot of players from the Indian team, like Kapil Dev and Krishnamachari Srikkanth. But, interestingly, and this is for hardcore cricket fans, I became a big fan of Harold Larwood after watching the Bodyline television miniseries.

6. I can’t resist this follow-up. Given your knowledge of the Bodyline series, you might also know that Don Bradman’s test cricket average of 99.94 (6996 runs scored over 70 times dismissed), one of the most outlying sports records (the best of the rest are just over 60), was agonizingly close to the surreal 100. The fact that batsmen can score so highly in a single “at-bat” illustrates the massive potential for statistics in cricket! Is sports analytics a burgeoning industry in India yet?

AB: Bradman was truly a genius. In fact, he stands out even if you compare batting medians instead of the means. I am not sure if sport statistics is big in India or not, I think the median consumer is not ready for it. As far as I know, the Indian Statistical Association have shown some interest in promoting sport statistics.
3 Bachelors degree in India

Anirban began his tertiary education in India by studying pharmaceutical technology and pharmaceutical science.

7. What exactly are pharmaceutical technology and pharmaceutical science?
   AB: *It's about the science of developing new drugs molecules and developing new ways to deliver these molecules inside the human body so that they can reach their intended destinations. So, it was a lot of chemistry and biology.*

8. What led you to study them?
   AB: *I did not intend to study them. We had to write an exam and be ranked to get into the top engineering colleges. I got a rank that gave me options of civil engineering versus pharmaceutical engineering. I was standing outside in queue to get my vote in. It was a hot day. I remember thinking, Man! I would rather stay in an A/C room and research viruses than working outside building roads. I chose pharmaceutical engineering* (Fig. 2).

9. What are the biggest differences between Indian and US colleges/universities from the student perspective?
   AB: *I did not do undergrad here and did not do graduate studies in India, so it's hard for me to directly compare. But, after applying some state-of-art indirect comparison*

![Fig. 2 Anirban on an adventure during his undergraduate years](image)
approaches, I can infer that the biggest difference in student’s perspectives between the two systems is that here you have a clearer sense of how knowledge will be applied to real life and there it is somewhat left to faith at the time of acquiring it that knowledge would be useful. But, I must admit that even after the application of the best methods, these assessments are subject to temporal biases, like availability of internet and email.

4 Development of interest in statistics

India has a very strong tradition in statistics. Rao, Mahanobois, Roy, Bose, Ghosh, Sen, Bhattacharya, Basu, Gupta … It is natural to wonder whether their reputation and impact had an influence on Anirban.

11. Were you influenced by any of these famous Indian statisticians; did you study with any of them?
   
   AB: I became interested in statistics during my Masters in Pharmaceutical Sciences and changed field to pursue a Masters in Biostatistics. I did get to discuss statistics with Prof. P.K. Sen at UNC. Looking back, it was one of the best decisions I made in my career.

12. Your namesake (Debabrata Basu) has an important theorem involving sufficient statistics. And of course, there’s Basu’s elephant. Are you a relative?
   
   AB: Not a relative. (I don’t think I have any famous Basu in our family). Funny story, when I was working on cost modeling and trying to convince a lot of people that log-transformed OLS has all sorts of problems, Basu’s theorem on the independence of mean and variance of a Normal distribution was thrown around a lot. I had to point out that such independence does not apply to a log-normal mean and its log transformed normal variance.

13. Who was the person(s) in India who had a particularly large influence on your career? Who were they and what was their impact?
   
   AB: Undoubtedly, my parents, who let go of their only son to far off land for higher education fully realizing that they will only get to see me once in a while for the rest of their lives.

14. Was there something at this stage that sparked your interest in economics, public policy and cost effectiveness analysis or did that come later?
   
   AB: I always had a curiosity for economics, partly because my father was an avid follower of financial news. I even wanted to do a Bachelor’s in Economics, but my parents shot it down in light of my engineering admission.

5 Graduate school in the United States

Like many exceptional students, Anirban moved to the United States for his graduate studies. Let’s find out what his motivations were and what happened upon arrival.

15. Why did you move to the US?
   
   AB: In 1995, right after I finished my undergrad I moved to the US. I think the main reason was to do graduate studies so I can get a better job.

16. Were you thinking of an academic career at this point? If not, what else were you thinking about?
AB: Nope. Get a master’s degree and start working at some industry, probably in research.

17. When you first came to the US it appears as though you were most interested in statistics—you obtained a MS from UNC. What were your plans at this stage?
   AB: Get a consulting job in “Data Sciences” although people did not call it that then.

18. What led you to attend University of Chicago and to study under David Melzer for the Ph.D. in Health Economics?
   AB: My interest was in applied quantitative methods. Also, I figured out soon that I am more interested in population health than basic sciences. Combined with my passion for economics, I ended up doing a PhD in Public Policy at U Chicago.

19. You have some very well-known papers from the early part of your career. What was the impetus for those?
   AB: The three papers from my dissertation provided the impetus for several follow-up papers. These are (1) Basu and Meltzer (JHE 2005): A microeconomic model showing that effects of patients’ health on their caregivers and family member’s health should be quantified, valued and included in the calculus of cost-effectiveness for efficient allocation of societal resources. (2) Basu and Meltzer (MDM 2007): Developed the Expected Value of Individualized Care (EVIC) framework that demonstrates the value of individualization in clinical care and showed that such individualization could be worth orders of magnitude higher than finding comparative effects on average. 3) Basu et al. (Stat Med 2006): A Bayesian hierarchical model of meta-analysis and disease progression in schizophrenia. All three papers were intended to advance the theory and methods in cost-effectiveness analysis. Several of my other papers were built on these works.

20. A number of your early papers pertain to pharma or pharmacoeconomics. It seems like your prior studies in India really prepared you for what you ended up doing in the US. Did you have a grand plan or did it just happen to work out?
   AB: The well laid plans of mice and men sometimes do work! When I started working on the Economics side of the field, the pharmaceutical jargon did not intimidate me.

21. You got to work with the likes of Willard Manning, John Mullahy, Paul Rathouz at Chicago in addition to David Melzer. It sounds like a fantastic environment! And you published several papers with all of them too! How did they each influence you?
   AB: I was quite fortunate to be in Chicago at a time when I enjoyed a confluence of brilliant economists, statisticians, econometricians and clinicians working together and debating about health care delivery and outcomes. It really prepared me to span the interdisciplinary nature of health throughout my career.

6 First position: assistant professor in U of Chicago Medical School

Anirban obtained a position as an Instructor in 2004 and then as an Assistant Professor at the University of Chicago Medical School in 2006. One’s first academic job is always a big step and time of expansion. Let’s see what was took place around this time for Anirban.

22. Did you look at any other places or positions than Chicago?
   AB: I had an offer from Yale and had interviewed with Harvard.

23. How did you become involved in the HPSS and ICHPS?
AB: Paul Rathouz encouraged me to apply for the HPSS student award paper for my EEE work (Basu Rathouz 2005 Biostatistics). I was one of the student winners that year and immediately hooked to the section and its members!

24. You started organizing conferences very early on in your career, including the ICHPS in 2010 just 5–6 years removed from your Ph.D. What motivated you to do this?

   AB: I felt that it is part of the academic duty to be a good citizen for our field. We do a lot of work that is uncompensated (for example, peer review) because it helps improve the academic ecosystem. I think organizing conferences is part of that.

25. Let’s be more specific: You founded the Annual Health Econometric meeting in 2009, you in large part single handedly hosted the ICHPS in 2010, and you hosted the Society of Medical Decision Making meeting in 2011. Three different conferences in three years! How did you possibly manage that?

   AB: Sometimes you get carried away doing your academic duties! I had lot of help from our organization committees and society administration.

26. Do you have any regrets given the large amount of time conference organization occupies?

   AB: No regrets. I met so many people, met linglong friends and many new collaborators, including you!

27. The paper you wrote with Joe Terza and Paul Rathouz on two-stage residual inclusion method seems to have really popularized that approach (Terza et al. 2008). It’s sparked a lot of comment by statisticians. What led to that collaboration and that particular piece of work?

   AB: Joe was working on this independently. Paul and I had done lot of simulation to study finite sample properties of estimators. Joe asked us whether to work together on understanding the properties of the 2SRI.

28. You also collaborated with James Heckman. What was that like and did he influence you?

   AB: Working with a Nobel Prize winner is always intimidating. I learned a ton from Jim and his works, really the underpinnings of causal inference, especially in the context of instrumental variables (Basu et al. Health Econ 2007). He was always very generous with his time toward me.

29. What is the favorite paper you have been involved in? Or the one that you are the most proud?

   AB: Now that’s hard to say, you are asking me to choose among my babies 😊. A few notable ones are:

   - My dissertation paper with Meltzer in the Medical Decision Making Journal on the value of individualized care [see above]
   - My Biostatistics paper with Paul Rathouz on the EEE model [see above]
   - A paper in Journal of Health Economics on the economic rationale for why average comparative effects creates more inefficiency in the health care system and ways to solve it (Basu et al. JHE 2011).
   - A paper in the Journal of Applied Econometrics where I extend Heckman and Vytlacil’s IV approaches to estimate individual level treatment effects that are more nuanced that conditional average treatment effects (Basu J App Econometrics 2014).
   - Another paper in Journal of Health Economics (which is my only fully theoretical paper) on why, in the presence of health insurance, the currently comparative effectiveness research infrastructure, including randomized trials, in health produces
biased estimates for any meaningful mean treatment effect parameter on which decision-making should hinge on (Basu JHE 2015).

30. By theoretical model, do you mean a model that develops or applies economic theory to a problem? I ask because I personally feel that graduate work in statistics has traditionally not focused enough attention on the skill of finding the most important problem to work on, preferring to supply problems already setup for the solution to be derived. Any thoughts?

AB: Yes. For example, in the 2015 JHE paper, I took a well-known theoretical model of behavior, known as Roy’s model (Oxford Economic Papers 1951), which captures self-selection by individual agents based on perceived costs and benefits of alternatives, and applied it to study conditions under which patients would agree to enter an RCT, when both the comparators are freely available to them under health insurance. An important focus of my work lately has been on understanding value of information methods to prioritize research. There is no reason why these methods cannot also be applied to research in statistical sciences. I think, in general, relating statistical sciences to real-world decision-making contexts would serve us all well. It is very satisfying to see so many of the HPSS members emerge themselves into the substantive clinical, services and policy questions.

31. Ever since I’ve known you you’ve had a knack for finding great restaurants to visit during conferences. Is cooking a hobby?

AB: Not really. Why do you think I look for good restaurants?

7 Second position: University of Washington

In 2011, as he progressed towards senior academic/researcher, Anirban moved to the University of Washington in Seattle. Let’s find out more about that move.

32. What led to your move to U Washington in 2011?

AB: My wife’s family is in the Northwest. We had young kids, being around family seemed a prudent choice. Glad it worked out just fine.

33. You have now mentored several junior researchers and students and the word is that you are a great mentor. Is it easier to be a mentee or a mentor?

AB: Thanks, I think it’s easier to be a mentee. As a mentor, you do carry a lot of responsibility but it is also very satisfying.

34. Data Science is changing the statistical profession, whether we like it or not. On the one hand there is a growing community of researchers developing new methods for causal inference, including in traditional economic areas such as instrumental variable methods. On the other there is the emergence of computationally focused techniques in which accuracy of prediction is paramount and interpretation/assumption checking seems of less concern. What’s the impact of data science in economics? What are the key trends in your own specialty areas: economics, health economics, microeconomics, cost effectiveness analysis? Is it fair to say that you are more an economist than a statistician? Given this, maybe you can provide a bit of an outsider’s view of recent trends in statistics.
AB: I think the evolution of the field of data science, beyond statistics, is mostly driven by the type of data we see these days, which spurs innovation in statistical methods.

One can think about the field of econometrics to be one where new statistical methods are developed and applied to test predictions from theoretical economic models of behavior, both at the individual and at the market level. In economics, causal inference is the king, as many economic problems aim to forecast effects of policies and prices on behavior. So data sciences, more specifically machine learning methods that focus on prediction and classification, do not immediately fit the requirements within the field. But what has changed over time is the tremendous flexibility in various spheres to manipulate data production. Consider Uber, Amazon, Facebook, and the list goes on. Embedding concepts of experimental designs at various points of data production infrastructures, economist have “bought” identification in their data and have been using machine learning to simultaneously test across many alternative economic models of behavior.

Health is one area where both pure factual prediction problems and problems of counterfactual predictions exist. There has been a lot of uptake of data science for the first set of problems. But unlike traditional economics, there are limited scope of large-scale manipulation of data production to apply machine learning for counterfactual predictions. But that has not deterred some researchers from applying these methods erroneously to causal inference problems, without a clear identification rationale. More recently, interesting methods that combine deep learning algorithms with instrumental variable approaches are beginning to show promise. But then again there are clinical researchers who are so tied to RCTs that they refuse to believe that randomization can exist outside of controlled environments.

I would say I am more of an economist than a statistician, but in much of my work, those differences fade because of the knowledge you must bring to bear on studying some of the problems.

35. What's next for you professionally? Will you continue with your current research thrusts or are new ones on the horizon?

AB: I want to continue to develop new methods and also figure out appropriate application of instrumental variable methods for observational data research. Another big thrust of my work is to understand heterogeneity in effects and how behavior (patient, provider, policy maker) changes when facing evidence about heterogeneity.

8 Current life outside of work

Balance is important in life. This is key for overworked academics in general let alone someone organizing an abundance of conferences and writing many influential papers. Let’s see how Anirban is balancing work.

36. What do you do for fun these days?

AB: Wine collection, hiking, MCU (Marvel Cinematic Universe) Analysis, NFL.

37. You are married with two kids. No doubt this occupies a lot of time. How do you manage everything?
AB: My wife helps me keep focused and organized. But, she also works full-time, and so I am grateful to have these opportunities to invest time to give back to the academic community (Fig. 3).

38. What advice do you give to people just entering college or earlier who are considering an academic career?
   AB: Not to think about what type of career they would end up in at the beginning of college. Just focus on the enjoying learning. Their preferences for type of career will evolve over time.

39. Would you encourage others to follow your footsteps? Do you think that your kids will follow your footsteps?
   AB: Not really. I had to find myself by going through a lot of changes and not being exposed to subjects early on that I really ended up liking. I would encourage others to try on different subjects early in their career. The key is to figure out things that you really do NOT enjoy doing early on. The rest will fall into place. My kids want to be a magician and a train driver. They have long ways to go!

9 Conclusion

Despite all that he has done, Anirban Basu’s future holds even greater promise. We fully expect to read many more influential papers led by or owing to Anirban. The chances are also high of attending a conference he’s organized, talking to a student he’s helped or influenced, or being led through a city to find a recommended restaurant!
Compliance with ethical standards

Conflict of interest  Neither author has received research grants or awards; honorariums from for-profit companies, non-profit organizations, or government agencies; or owns stock in any company that creates a conflict of interest in relation to this paper. However, Dr. Bansal is a faculty member at the same institution as Dr. Basu and both Dr. O’Malley and Dr. Bansal are members of the ASA Section on Health Policy Statistics along with Dr. Basu. Despite this, neither author declares any conflict of interest.

Ethical approval  This paper does not contain any studies with animals performed by any of the authors. This paper does not contain any studies with human participants or animals performed by any of the authors.

Informed consent  Informed consent was obtained from Dr. Basu prior to his interview.

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