



# Top 100 cited articles in recent tobacco research

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## ABSTRACT

**Background:** The total citations that a peer-reviewed manuscript has is often used to measure the impact that a publication has in its respective field of study. Both the citation count and total number of publications are often used as measures of academic productivity and success. This issue has been previously investigated in the field of tobacco control research. Given the changing landscape in the field of tobacco research since 2004, we sought to re-examine this issue. The study purpose was to identify the 100 top-cited tobacco-related articles published since 2005, and to categorize and describe the fields of the study represented in these articles. **Methods:** We searched the Scopus library database to determine the citations of the top 100 tobacco-related articles. Information was gathered on title, number of authors, publication year, journal name and impact factor, country of origin, article type, and subject category. Articles were selected and analyzed by two independent investigators. **Results:** We identified the 100 top-cited articles published in 58 journals, led by *The New England Journal of Medicine* (8) and *Lancet* (6), between 2005 and 2014. The United States was the most common country of origin for the highly-cited articles. The top article types were observation (27%), basic science (26%), and review articles (24%). The most common article subject area was medicine (74%). A statistically significant association was found between the journal impact factor and the number of top 100 cited articles ( $P = 0.03$ ). **Conclusions:** This review may be helpful to identify articles that may be contributing to the conduct of current and future tobacco research. The analysis can be used as a reference to review and evaluate the publications that are making a high impact in the field of tobacco research.

**KEY WORDS:** Electronic cigarettes, secondhand smoke exposure, tobacco research, tobacco use

## INTRODUCTION

Although an imperfect measure, the total citations that a peer-reviewed manuscript has is often used to measure the impact that a publication has in its respective field of study. Manuscripts that are highly cited are often those that describe topics, experimental designs and current trends in the field. Moreover, many institutions scrutinize the total number of citations that a faculty member has received for their total collective publications as a measure of recognition in their scientific field of research. Both the citation count and total number of publications are often used as measures of academic productivity and success [1-6].

This issue has been previously investigated in the field of tobacco control research. In 2005, Byrne and Chapman [4] published the results of their investigation of the most highly cited authors

in tobacco control from 1980-2004. This study found that approximately 48.5% of the most highly-cited authors conducted research in the field of epidemiology followed by 14.5% in the field of psychology and 14.5% in the field of medicine. This analysis also identified and analyzed the top 50 most highly cited papers. Given the changing landscape in the field of tobacco research since 2004, we sought to re-examine this issue. The goal of this study was to identify the 100 top-cited tobacco-related articles published since 2005 and to identify characteristics of those articles such as journal names, impact factors and immediacy index, author names and sex, article type, and subject areas.

## METHODS

We did a document search of the Scopus Library database (www.scopus.com) in January 2016 to obtain citations of

published, peer-reviewed, tobacco-related, and research articles. Scopus was used in this study since this accurate and comprehensive database has the largest number of abstracts and citations with more than 20,500 titles from over 5,000 international publishers (www.scopus.com). To compile a comprehensive list of tobacco-related manuscripts published during 2005-2014, we searched the Scopus database for the following keywords in the title using the “OR” operator: Tobacco, tobacco use, nicotine, electronic nicotine delivery system, electronic cigarette, e-cigarette, smoke exposure, secondhand smoke, secondhand smoke exposure, environmental tobacco smoke, tobacco smoke exposure, passive smoke exposure, passive smoke, or smoke. “All” document types and “English” language were selected. The articles identified by these search terms were accessed and reviewed online through the National Institutes of Health library. Electronic copies were available for all articles. The articles from the database were sorted from most-to-least citations using the option “times cited.” The first 124 articles identified were reviewed using previously described methods [7-9]. Two independent investigators (ALM, EMMG) reviewed the articles and excluded one clinical practice guideline, one non-peer reviewed conference paper, one review article in a non-peer reviewed book, nine Centers for Disease Control and Prevention’s *Morbidity and Mortality Weekly Reports* [10], and four non-peer reviewed articles from the Cochrane Database of Systematic Reviews [11]. In addition, to maintain focus on tobacco research, three articles with a sole focus on never smokers that did not report on any tobacco measures were excluded. Five articles that focused on tobacco plants, tobacco mosaic virus, smoke antimicrobials, and non-tobacco smoke-related pollution were also excluded.

Of the remaining 113 articles, the top 100 were exported into an excel spreadsheet and reviewed. The following data were compiled: Title, year of publication, number of citations, journal name, first author, last author, number of authors, country of origin, journal impact factor, and immediacy index. Subsequently, two independent investigators (ALM, JSG) reviewed the 100 articles and determined article type: Original research (randomized clinical trial; both single blind and double-blind were included), observational study (which included case-control studies, cohort studies, and case series), basic science study, meta-analysis, or review article. To categorize manuscripts by subject area, we queried Scopus to determine “Subject Areas” which included medicine, nursing, biochemistry/genetics/molecular biology, and other areas. Since the Scopus “subject areas” did not include epidemiology, all articles were subcategorized into epidemiology or not epidemiology by the same two independent reviewers. Disagreements were resolved by the third investigator (EMMG). The journal impact factor and immediacy index were obtained using the ISI Web of Knowledge database [12] for the year 2014.

Using the Pearson product-moment correlation coefficient, we evaluated the strength and direction of the linear relationship between the impact factor of the journal and the number of top 100 cited articles included in the list. The statistical software package used for data analysis was SPSS version 23.0. Data

are presented as means, medians, and interquartile ranges. A significance level of  $\alpha = 0.05$  was used for all the comparisons.

Our investigation did not require Institutional Review Board approval as routine data were used in this study.

## RESULTS

The number of citations for the top 100 cited articles from 2005 to 2014 ranged from 209 to 899 [Table 1]. The mean number of citations was 327.16, and the median was 272 (interquartile range: 118). The mean number of authors was 13.75, and the median was seven (interquartile range: 10.75). Most articles ( $n = 79$ ) were published in the 3-year period between 2005 and 2008. The journal with the highest number of top 100 cited articles was the *New England Journal of Medicine* (NEJM) with eight [Table 2], followed by the *Lancet* with six. *The Journal of the American Medical Association* (JAMA), *Nature*, and *Nicotine and Tobacco Research* each had four highly-cited articles. The impact factors for journals with the top 100 cited articles ranged from 1.929 to 55.873. The highest immediacy index also belonged to the journal with the highest impact factor (NEJM). We found a statistically significant association between journal impact factor and the number of top 100 cited articles ( $P = 0.03$ ).

There were 17 different countries of origin for the highly-cited articles. The United States (U.S.) had the most articles (55). The United Kingdom published a total of nine articles. Canada and France each published five articles and Italy published four articles.

The top-cited article was “Efficacy of varenicline, a  $\alpha 4\beta 2$  nicotinic acetylcholine receptor partial agonist, versus placebo or sustained-release bupropion for smoking cessation: A randomized controlled trial (RCT)” published in JAMA by Jorenby *et al.* [13]. The author with the highest number of papers published was Reeves with five publications. There were seven authors who had four publications and these authors were Benowitz, Billing, Breslau, Hatsukami, Madden, Williams, and Watsky. The majority of the first authors (66%) were male.

Agreement on article type was 88%; disagreements were resolved by the third investigator. The article types were reviewed as follows: Observational (27%), basic science (26%), review articles (24%), meta-analyses (12%), and RCT (11%). The top three “subject areas” as classified by Scopus was medicine (74%), biochemistry/genetics/molecular biology (28%), and neuroscience (6%); 1% was in the area of psychology. We further subcategorized the articles into epidemiology versus non-epidemiology with 84% agreement; disagreements were resolved by the third investigator. A total of 35 articles were subcategorized as belonging to the “epidemiology” field.

## DISCUSSION

We identified the 100 most cited tobacco-related articles in the 10-year period from 2005 to 2014. This bibliometric

**Table 1: List of 100 most cited articles on tobacco**

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
1.	Efficacy of varenicline, an $\alpha 4\beta 2$ nicotinic acetylcholine receptor partial agonist, versus placebo or sustained-release bupropion for smoking cessation: A RCT	899	2006	United States	Jorenby DE	Reeves KR	9	<i>JAMA</i>
2.	Varenicline, an $\alpha 4\beta 2$ nicotinic acetylcholine receptor partial agonist, versus sustained-release bupropion and placebo for smoking cessation: A RCT	888	2006	United States	Gonzales D	Reeves KR	10	<i>JAMA</i>
3.	A variant associated with nicotine dependence, lung cancer and peripheral arterial disease	823	2008	Iceland	Thorgeirsson TE	Stefansson K	57	<i>Nature</i>
4.	The collective dynamics of smoking in a large social network	721	2008	United States	Christakis NA	Fowler JH	2	<i>NJEM</i>
5.	The effects of a smoking cessation intervention on 14.5-year mortality: A randomized clinical trial	695	2005	United States	Anthonisen NR	Connett JE	6	<i>Annals of Internal Medicine</i>
6.	A new model for an etiology of rheumatoid arthritis: Smoking may trigger HLA-DR (shared epitope)-restricted immune reactions to autoantigens modified by citrullination	629	2006	Sweden	Klareskog L	Alfredsson L	13	<i>Arthritis and rheumatism</i>
7.	Obesity, cigarette smoking, and telomere length in women	629	2005	United Kingdom	Valdes AM	Spector TD	8	<i>Lancet</i>
8.	Metabolism and disposition kinetics of nicotine	607	2005	United States	Hukkanen J	Benowitz NL	3	<i>Pharmacological Reviews</i>
9.	Varenicline: An alpha; 4 $\beta$ 2 nicotinic receptor partial agonist for smoking cessation	573	2005	United States	Coe JW	O'Neill BT	21	<i>Journal of Medicinal Chemistry</i>
10.	A small-cell lung cancer genome with complex signatures of tobacco exposure	566	2010	United Kingdom	Pleasant ED	Campbell PJ	40	<i>Nature</i>
11.	Annual report to the nation on the status of cancer, 1975-2005, featuring trends in lung cancer, tobacco use, and tobacco control	536	2008	United States	Jemal A	Edwards BK	13	<i>Journal of the National Cancer Institute</i>
12.	Cardiovascular effects of secondhand smoke: Nearly as large as smoking	491	2005	United States	Barnoya J	Glantz SA	2	<i>Circulation</i>
13.	A meta-analysis of worldwide studies demonstrates an association between schizophrenia and tobacco smoking behaviors	469	2005	United States	De Leon J	Diaz FJ	2	<i>Schizophrenia Research</i>
14.	Damage to the insula disrupts addiction to cigarette smoking	468	2007	United States	Naqvi NH	Bechara A	4	<i>Science</i>
15.	Tobacco use and risk of myocardial infarction in 52 countries in the Interheart study: A case-control study	458	2006	Canada	Teo KK	Yusuf S	12	<i>Lancet</i>
16.	Cancer risk in the Swiss HIV cohort study: Associations with immunodeficiency, smoking, and highly active antiretroviral therapy	457	2005	France	Clifford GM	Yerly S	52	<i>Journal of the National Cancer Institute</i>

(Contd...)

Table 1: (Continued)

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
17.	Cholinergic nicotinic receptor genes implicated in a nicotine dependence association study targeting 348 candidate genes with 3713 SNPs	453	2007	United States	Saccone SF	Bierut LJ	22	<i>Human Molecular Genetics</i>
18.	Effect of maintenance therapy with varenicline on smoking cessation: A RCT	431	2006	Norway	Tonstad S	Reeves KR	6	<i>JAMA</i>
19.	Active smoking and the risk of Type 2 diabetes: A systematic review and meta-analysis	418	2007	Switzerland	Willi C	Cornuz J	5	<i>JAMA</i>
20.	Systemic effects of smoking	401	2007	Netherlands	Yanbaeva DG	Wouters EFM	5	<i>Chest</i>
21.	A review of human carcinogens - Part E: Tobacco, areca nut, alcohol, coal smoke, and salted fish	388	2009	France	Secretan B	WHO International Agency for Research on Cancer Monograph Working Group	12	<i>The Lancet Oncology</i>
22.	Smoking and fracture risk: A meta-analysis	386	2005	United Kingdom	Kanis JA	Tenenhouse A	15	<i>Osteoporosis International</i>
23.	Worldwide burden of disease from exposure to second-hand smoke: A retrospective analysis of data from 192 countries	383	2011	Sweden	Öberg M	Prüss-Ustün A	5	<i>Lancet</i>
24.	Novel genes identified in a high-density genome wide association study for nicotine dependence	363	2007	United States	Bierut LJ	Ballinger DG	22	<i>Human Molecular Genetics</i>
25.	Cigarette smoking, body mass index, and stressful life events as risk factors for psoriasis: Results from an Italian case-control study	351	2005	Italy	Naldi L	La Vecchia C	21	<i>Journal of Investigative Dermatology</i>
26.	Nicotine reinforcement and cognition restored by targeted expression of nicotinic receptors	338	2005	France	Maskos U	Changeux JP	19	<i>Nature</i>
27.	Outcome criteria in smoking cessation trials: Proposal for a common standard	336	2005	United Kingdom	West R	Stapleton J	4	<i>Addiction</i>
28.	EGFR, p16, HPV titer, Bcl-xL and p53, sex, and smoking as indicators of response to therapy and survival in oropharyngeal cancer	329	2008	United States	Kumar B	Carey TE	19	<i>Journal of Clinical Oncology</i>
29.	Alcohol drinking in never users of tobacco, cigarette smoking in never drinkers, and the risk of head and neck cancer: Pooled analysis in the international head and neck cancer epidemiology consortium	328	2007	France	Hashibe M	Boffetta P	36	<i>Journal of the National Cancer Institute</i>
30.	Effects of abstinence from tobacco: Valid symptoms and time course	318	2007	United States	Hughes JR	-	1	<i>Nicotine and Tobacco Research</i>
31.	Trends in head and neck cancer incidence in relation to smoking prevalence: An emerging epidemic of HPV-associated cancers?	317	2007	United States	Sturgis EM	Cinciripini PM	2	<i>Cancer</i>
32.	Genome-wide meta-analyses identify multiple loci associated with smoking behavior	312	2010	United States	Furberg H	Sullivan PF	116	<i>Nature Genetics</i>

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Table 1: (Continued)

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
33.	Do you smoke after text? Results of a randomized trial of smoking cessation using mobile phone text messaging	310	2005	New Zealand	Rodgers A	Jones M	7	<i>Tobacco Control</i>
34.	Pharmacological profile of the $\alpha 4\beta 2$ nicotinic acetylcholine receptor partial agonist varenicline, an effective smoking cessation aid	307	2007	United States	Rollema H	Williams KE	15	<i>Neuropharmacology</i>
35.	Consequences of smoking for body weight, body fat distribution, and insulin resistance	303	2008	Switzerland	Chiolero A	Cornuz J	4	<i>American Journal of Clinical Nutrition</i>
36.	Guidelines on nicotine dose selection for <i>in vivo</i> research	303	2007	United States	Matta SG	Zirger JM	30	<i>Psychopharmacology</i>
37.	Antielastin autoimmunity in tobacco smoking-induced emphysema	302	2007	United States	Lee SH	Kheradmand F	15	<i>Nature Medicine</i>
38.	Sequence variants at CHRN3-CHRNA6 and CYP2A6 affect smoking behavior	299	2010	Iceland	Thorgeirsson TE	Stefansson K	94	<i>Nature Genetics</i>
39.	Lung cancer in never smokers: A review	297	2007	United States	Subramanian J	Govindan R	2	<i>Journal of Clinical Oncology</i>
40.	Ethnic and racial differences in the smoking-related risk of lung cancer	292	2006	United States	Haiman CA	Marchand LL	7	<i>NEJM</i>
41.	Nicotine addiction	291	2010	United States	Benowitz NL	-	1	<i>NEJM</i>
42.	Variants in nicotinic receptors and risk for nicotine dependence	291	2008	United States	Bierut LJ	Goate AM	33	<i>American Journal of Psychiatry</i>
43.	Impact of obesity and smoking on psoriasis presentation and management	288	2005	United States	Herron MD	Krueger GG	7	<i>Archives of Dermatology</i>
44.	Tobacco use and cessation in psychiatric disorders: National Institute of Mental Health report	285	2008	United States	Ziedonis DM	Riley WT	12	<i>Nicotine and Tobacco Research</i>
45.	Chronic disease prevention: health effects and financial costs of strategies to reduce salt intake and control tobacco use	284	2007	United Kingdom	Asaria P	Beaglehole R	5	<i>Lancet</i>
46.	$\alpha$ -5/ $\alpha$ -3 nicotinic receptor subunit alleles increase risk for heavy smoking	280	2008	United States	Berrettini W	Mooser V	9	<i>Molecular Psychiatry</i>
47.	Genomic landscape of non-small cell lung cancer in smokers and never-smokers	279	2012	United States	Govindan R	Wilson RK	21	<i>Cell</i>
48.	Toward a global view of alcohol, tobacco, cannabis, and cocaine use: Findings from the WHO world mental health surveys	276	2008	Australia	Degenhardt L	Wells JE	21	<i>PLoS Medicine</i>
49.	Prenatal tobacco smoke exposure affects global and gene-specific DNA methylation	275	2009	United States	Breton CV	Gilliland FD	6	<i>American Journal of Respiratory and Critical Care Medicine</i>
50.	Meta-analysis and imputation refines the association of 15q25 with smoking quantity	273	2010	United Kingdom	Liu JZ	Marchini J	106	<i>Nature Genetics</i>
51.	Smoking as a risk factor for dementia and cognitive decline: A meta-analysis of prospective studies	271	2007	Australia	Anstey KJ	O'Kearney R	4	<i>American Journal of Epidemiology</i>

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Table 1: (Continued)

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
52.	Pathobiology of cigarette smoke-induced chronic obstructive pulmonary disease	270	2007	United States	Yoshida T	Tuder RM	2	<i>Physiological Reviews</i>
53.	C-reactive protein in patients with COPD, control smokers and non-smokers	267	2006	United States	Pinto-Plata VM	Celli BR	7	<i>Thorax</i>
54.	Co-morbidity of smoking in patients with psychiatric and substance use disorders	267	2005	United States	Kalman D	George TP	3	<i>American Journal on Addictions</i>
55.	The accuracy of self-reported smoking: A systematic review of the relationship between self-reported and cotinine-assessed smoking status	266	2009	Canada	Gorber SC	Tremblay M	5	<i>Nicotine and Tobacco Research</i>
56.	Protein carbamylation links inflammation, smoking, uremia and atherogenesis	263	2007	United States	Wang Z	Hazen SL	10	<i>Nature Medicine</i>
57.	Airway epithelial gene expression in the diagnostic evaluation of smokers with suspect lung cancer	261	2007	United States	Spira A	Brody JS	18	<i>Nature Medicine</i>
58.	Efficacy and safety of the novel selective nicotinic acetylcholine receptor partial agonist, varenicline, for smoking cessation	257	2006	United States	Oncken C	Reeves KR	8	<i>Archives of Internal Medicine</i>
59.	First-SIGNAL: First-line single-agent irressa versus gemcitabine and cisplatin trial in never-smokers with adenocarcinoma of the lung	255	2012	South Korea	Han JY	Lee JS	16	<i>Journal of Clinical Oncology</i>
60.	Evidence of a dose-response relationship between "truth" antismoking ads and youth smoking prevalence	254	2005	United States	Farrelly MC	Healton CG	5	<i>American Journal of Public Health</i>
61.	Smoking cessation with varenicline, a selective $\alpha 4\beta 2$ nicotinic receptor partial agonist: Results from a 7-week, randomized, placebo- and bupropion-controlled trial with 1-year follow-up	253	2006	United States	Nides M	Reeves KR	7	<i>Archives of Internal Medicine</i>
62.	Cigarette smoke induces proinflammatory cytokine release by activation of NF- $\kappa$ B and posttranslational modifications of histone deacetylase in macrophages	252	2006	United States	Yang SR	Rahman I	8	<i>American Journal of Physiology - Lung Cellular and Molecular Physiology</i>
63.	21 <sup>st</sup> century hazards of smoking and benefits of cessation in the United States	249	2013	Canada	Jha P	Peto R	8	<i>NEJM</i>
64.	Patterns of global tobacco use in young people and implications for future chronic disease burden in adults	248	2006	United States	Warren CW	Asma S	4	<i>Lancet</i>
65.	Distinct epidermal growth factor receptor and KRAS mutation patterns in non-small cell lung cancer patients with different tobacco exposure and clinicopathologic features	245	2006	Hong Kong	Tam IYS	Wong MP	12	<i>Clinical Cancer Research</i>
66.	Electronic cigarettes for smoking cessation: A RCT	244	2013	New Zealand	Bullen C	Walker N	7	<i>Lancet</i>

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Table 1: (Continued)

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
67.	Nicotine use in schizophrenia: The selfmedication hypotheses	243	2005	United Kingdom	Kumari V	Postma P	2	<i>Neuroscience and Biobehavioral Reviews</i>
68.	Smoke-free legislation and hospitalizations for acute coronary syndrome	240	2008	United Kingdom	Pell JP	Borland W	14	<i>NEJM</i>
69.	Cigarette smoking strongly modifies the association of LOC387715 and age-related macular degeneration	240	2006	United States	Schmidt S	Pericak-Vance MA	12	<i>American Journal of Human Genetics</i>
70.	Clinical pharmacology of nicotine: Implications for understanding, preventing, and treating tobacco addiction	239	2008	United States	Benowitz NL	-	1	<i>Clinical Pharmacology and Therapeutics</i>
71.	A RCT of financial incentives for smoking cessation	238	2009	United States	Volpp KG	Audrain-McGovern J	13	<i>NEJM</i>
72.	Alcohol, tobacco and obesity are synergistic risk factors for hepatocellular carcinoma	237	2005	United States	Marrero JA	Lok AS	6	<i>Journal of Hepatology</i>
73.	Tobacco smoke, indoor air pollution and tuberculosis: A systematic review and meta-analysis	235	2007	United States	Lin HH	Murray M	3	<i>PLoS Medicine</i>
74.	Smoking and age-related macular degeneration: A review of association	235	2005	United Kingdom	Thornton J	Kelly SP	6	<i>Eye</i>
75.	Effects of tobacco smoke on immunity, inflammation and autoimmunity	231	2010	Israel	Arnson Y	Amital H	3	<i>Journal of Autoimmunity</i>
76.	Sirtuin regulates cigarette smoke-induced proinflammatory mediator release via RelA/p65 NF- $\kappa$ B in macrophages <i>in vitro</i> and in rat lungs <i>in vivo</i> : Implications for chronic inflammation and aging	230	2007	United States	Yang SR	Rahman I	6	<i>American Journal of Physiology - Lung Cellular and Molecular Physiology</i>
77.	Frequency and distinctive spectrum of KRAS mutations in never smokers with lung adenocarcinoma	228	2008	United States	Riely GJ	Ladanyi M	12	<i>Clinical Cancer Research</i>
78.	Smoking and colorectal cancer: A meta-analysis	226	2008	Italy	Botteri E	Maisonneuve P	6	<i>JAMA</i>
79.	A nationally representative case-control study of smoking and death in India	226	2008	Canada	Jha P	Peto R	12	<i>NEJM</i>
80.	Maternal smoking, drinking or cannabis use during pregnancy and neurobehavioral and cognitive functioning in human offspring	226	2006	Netherlands	Huizink AC	Mulder EJH	2	<i>Neuroscience and Biobehavioral Reviews</i>
81.	A generalized combinatorial approach for detecting gene-by-gene and gene-by-environment interactions with application to nicotine dependence	223	2007	United States	Lou XY	Li MD	7	<i>American Journal of Human Genetics</i>
82.	Reductions in tobacco smoke pollution and increases in support for smoke-free public places following the implementation of comprehensive smoke-free workplace legislation in the Republic of Ireland: Findings from the ITC Ireland/UK Survey	223	2006	Canada	Fong GT	Driezen P	15	<i>Tobacco Control</i>

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Table 1: (Continued)

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
83.	Effects of cigarette smoking on spatial working memory and attentional deficits in schizophrenia involvement of nicotinic receptor mechanisms	223	2005	United States	Sacco KA	George TP	9	<i>Archives of General Psychiatry</i>
84.	Cardiovascular mortality and exposure to airborne fine particulate matter and cigarette smoke shape of the exposure-response relationship	222	2009	United States	Pope III AC	Thun MJ	7	<i>Circulation</i>
85.	Interaction between tobacco and alcohol use and the risk of head and neck cancer: Pooled analysis in the international head and neck cancer Epidemiology consortium	222	2009	France	Hashibe M	Boffetta P	43	<i>Cancer Epidemiology Biomarkers and Prevention</i>
86.	Tobacco smoking and cancer: A meta-analysis	222	2008	Italy	Gandini S	Boyle P	7	<i>International Journal of Cancer</i>
87.	Gene-gene and gene-environment interactions involving HLA-BRB1, PTPN22, and smoking in two subsets of rheumatoid arthritis	220	2007	Sweden	Källberg H	Alfredsson L	10	<i>American Journal of Human Genetics</i>
88.	Smoking and inflammatory bowel disease: A meta-analysis	218	2006	United States	Mahid SS	Galantiuk S	5	<i>Mayo Clinic Proceedings</i>
89.	Downregulation of microRNA expression in the lungs of rats exposed to cigarette smoke	217	2009	Italy	Izzotti A	De Flora S	6	<i>FASEB Journal</i>
90.	Risk of tuberculosis from exposure to tobacco smoke: A systematic review and meta-analysis	217	2007	United States	Bates MN	Smith KR	6	<i>Archives of Internal Medicine</i>
91.	Habenular $\alpha 5$ nicotinic receptor subunit signaling controls nicotine intake	214	2011	United States	Fowler CD	Kenny PJ	5	<i>Nature</i>
92.	Trends in smoking behavior between 1985 and 2000 in nine European countries by education	214	2005	Netherlands	Giskes K	Mackenbach JP	17	<i>Journal of Epidemiology and Community Health</i>
93.	Electronic cigarette: Users profile, utilization, satisfaction and perceived efficacy	213	2011	Switzerland	Etter JF	Bullen C	2	<i>Addiction</i>
94.	Acute consumption of flavanol-rich cocoa and the reversal of endothelial dysfunction in smokers	213	2005	Germany	Heiss C	Kelm M	7	<i>Journal of the American College of Cardiology</i>
95.	It is not "either/or": Activation and desensitization of nicotinic acetylcholine receptors both contribute to behaviors related to nicotine addiction and mood	212	2008	United States	Picciotto MR	Brunzell DH	4	<i>Progress in Neurobiology</i>
96.	Polycyclic aromatic hydrocarbons, carbon monoxide, "tar," and nicotine in the mainstream smoke aerosol of the narghile water pipe	212	2005	Lebanon	Shihadeh A	Saleh R	2	<i>Food and Chemical Toxicology</i>
97.	Forecasting the effects of obesity and smoking on U.S. life expectancy	210	2009	United States	Stewart ST	Rosen AB	3	<i>NEJM</i>
98.	Smoking affects response to inhaled corticosteroids or leukotriene receptor antagonists in asthma	210	2007	United States	Lazarus SC	Fahy JV	22	<i>American Journal of Respiratory and Critical Care Medicine</i>

(Contd...)

**Table 1: (Continued)**

Rank	Article	Citations	Year of publication	Country	1 <sup>st</sup> author	Last author	# Authors	Journal
99.	Water-pipe (narghile) smoking: An emerging health risk behavior	210	2005	Israel	Knishkowsky B	Amitai Y	2	<i>Pediatrics</i>
100.	Time to first cigarette in the morning as an index of ability to quit smoking: Implications for nicotine dependence	209	2007	United States	Baker T	Toll B	15	<i>Nicotine and Tobacco Research</i>

HLA-DR: Human leukocyte antigen - antigen D related, RCT: Randomized controlled trial, SNP: Single nucleotide polymorphism, EGFR: Epidermal growth factor receptor, HPV: Human papillomavirus, *NEJM*: *New England Journal of Medicine*, COPD: Chronic obstructive pulmonary disease, NF: Nuclear factor, *JAMA*: *Journal of the American Medical Association*

**Table 2: Article citations, impact factor, and immediacy index according to journal**

Rank	Name of journal	Number of citations	Impact factor	Immediacy index
1.	<i>NEJM</i>	8	55.873	13.844
2.	<i>Lancet</i>	6	45.217	12.967
3.	<i>JAMA</i>	4	35.289	10.189
4.	<i>Nature</i>	4	41.456	9.585
5.	<i>Nicotine and Tobacco Research</i>	4	3.296	0.620
6.	<i>American Journal of Human Genetics</i>	3	10.931	2.020
7.	<i>Archives of Internal Medicine</i>	3	17.333	5.913*
8.	<i>Journal of Clinical Oncology</i>	3	18.443	5.496
9.	<i>Journal of the National Cancer Institute</i>	3	13.757	3.308
10.	<i>Nature Genetics</i>	3	29.352	5.938
11.	<i>Nature Medicine</i>	3	28.223	5.935
12.	<i>Addiction</i>	2	4.829	2.125
13.	<i>Human Molecular Genetics</i>	2	6.393	1.596
14.	<i>American Journal of Physiology - Lung Cellular and Molecular Physiology</i>	2	4.080	0.896
15.	<i>Circulation</i>	2	15.073	4.508
16.	<i>American Journal of Respiratory and Critical Care Medicine</i>	2	12.996	3.056
17.	<i>Clinical Cancer Research</i>	2	8.722	1.854
18.	<i>Tobacco Control</i>	2	5.933	2.133
19.	<i>Neuroscience and Biobehavioral Reviews</i>	2	8.802	1.657
20.	<i>PLoS Medicine</i>	2	14.429	2.570

\*Immediacy index not available for 2014; Last available immediacy index was 5.913 in 2012. *NEJM*: *New England Journal of Medicine*, *JAMA*: *Journal of the American Medical Association*

literature analysis is useful in understanding the recent areas of interest and potential impact of tobacco research. The top five articles were published in journals with impact factors that ranged from 17.81 to 55.873. It is interesting to note that only six of the articles on our list were published in the two specific tobacco journals of *Nicotine and Tobacco Research* and *Tobacco Control* and that the first article on the list from those two journals appeared at number 30 (in *Nicotine and Tobacco Research*). In 2012, another investigation identified the top 20 cited papers specifically published in *Tobacco Control* between 1998 and September 2011 [14]. The two papers published in *Tobacco Control* that were on our list were not included in this prior investigation due to search techniques. Unlike the investigation published in 2005 [4] which found that 80% of the top 50 papers were published in journals with impact factors

of 2.352 and above, we found that 85% of the top 100 papers were published in journals with impact factors over 5.0. It is also worth noting that four of the top five articles were classified by Scopus as belonging in the “medicine” category. Again, unlike the investigation published in 2005 [4], epidemiology papers did not dominate this analysis, but the majority of articles were in the field of medicine. However, similar to the previous investigation and other similar analyses, higher impact journals had a higher number of publications. In addition, there was a dominance of male first authors (66%), and the majority came from authors in the U.S., which may reflect a greater availability for funding of tobacco research or a bias toward publication of studies that are conducted in the U.S. [4,8,15].

Similar to other bibliometric analyses, there are potential limitations. This analysis will disproportionately favor older published articles, which have had a longer time to garner citations [16,17]. The use of the Scopus database is a potential shortcoming as it is a dynamic database which updates daily, thus our results may not be accurate if the same search strategy were performed today. Although Scopus is the world’s largest abstract and citation database, tobacco publications with high article metrics that were not indexed in this particular database were excluded. Thus, we may have missed important top cited tobacco articles. Further, we may have inadvertently omitted important publications by search criteria chosen. Finally, the method of using journal citations as a measure is potentially skewed due to authors’ self-citations or the “snowball effect,” which can result when some authors cite certain articles simply because they have been cited before, but not necessarily due to their relevance to a publication [18,19].

However, our analysis provides information into the frequency of citations of tobacco-related research articles and the content areas of these influential publications. This review may be helpful to identify articles that may be contributing to the conduct of current and future tobacco research. The analysis can be used as a reference to review and evaluate the publications that are making a high impact in the field of tobacco research.

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