

BARRIERS ASSOCIATED WITH NON-IMMUNIZATION AMONG CHILDREN UNDER TWO YEARS OF AGE IN THE SOUTHERN PUNJAB, PAKISTAN

Dr. Syed Razi Abbas^{*}, Dr. Ahmad Bilal Ashraf^{**}, Dr. Hamza Qadir^{**}

^{*} Medical Affairs Division
Lucky Core Industries Limited

Abstract-

Objective(s): to determine the barriers associated with non/partial immunization in children less than 2 years of age.

Methodology: This community based cross-sectional study was conducted in 15 UCs of Tehsil Kot Addu, District Muzaffargarh for a period of nine months by recruiting 264 mothers (caregivers). Multistage random sampling technique, lottery method and bottleneck method was used to select the tehsils, UCs and households for the study. Households with children between eighteen to twenty-four months of age and Mothers/Caregivers with age between twenty to fifty years were included in the study. The semi-structured questionnaire was used to collect information regarding demographic and socioeconomic status of mothers/caregivers and social and cultural factors causing non/partial immunization of children were also explored. Data were analyzed using descriptive statistics and association was calculated between immunization status of a children and demographic factors using chi-square test with a 95% confidence interval and value < 0.05 was taken as significant.

Results: The average age of respondents was 32.45 years (ranged from 20 to 50 years) with the average monthly household income of amounted to PKR 20,000 (IQR = 18,750). Parents/caregivers elucidated barriers to routine immunization including influence by in-laws (45.10%), neighbors (39%), or employer (34.80%) for not to vaccinate children; financial (31.10%) and travel issues (34.50%) to far off

areas for vaccination; stock-outs at health facility (36.40%); unavailability of trained staff for vaccination (25.80%) and parent's doubt on the competency of vaccination staff (28.80%). The majority of children (67.40%) were fully immunized followed by partially immunized children (25.80%) and non-immunized children (6.80%). Moreover, the immunization status of a child was not significantly associated with community location ($p = 0.299$), family type ($p = 0.112$) and occupation of the mother ($p = 0.267$).

Conclusion(s): Key barriers identified toward childhood immunization included influence of family and peers, transportation issues, financial issues, and healthcare delivery system related issues like unavailability of vaccines, unavailability of staff. The parents were concerned regarding vaccine quality. The religious leaders and public figures were also highlighted as a key obstacle to vaccinate children in the area.

Index Terms- Barriers, Non-immunization, Southern Punjab, Pakistan, Developing Country

I. INTRODUCTION

The immunization is the process through which the immune system of the body is strengthened to fight various infectious diseases by administrating artificial antibodies through a different route of administration.¹ This process has been proven effective to prevent and control most of the diseases in children and adults.² Vaccination not only induces immunity in an

individual for a specific pathogen that ultimately reduces morbidity and mortality but also impacts incidence and prevalence rates of a specific disease by covering a large population and causing herd immunity for the rest.³ Because of vaccination for communicable diseases, health threats faced by many developed and developing countries have been reduced and a substantial decline in children morbidity and mortalities have been observed across the globe.⁴

The concept of immunization was introduced at the end of the 18th century, but the world has achieved benefits of vaccination in the very previous decades.⁵ In 1990s conjugate vaccination of Hib (Hemophilus Influenza Type b) resulted in a 99% decline of meningitis due to Hib in children under the age of five years. Similarly, in the year 2000 introduction of pneumococcal conjugate vaccine in resulted in the decline of meningitis due to streptococcus pneumonia in one year from 99 cases per 100,000 to 21 cases per 100,000.⁶ By the year 2011, 90% reduction in the cases of pneumococcal diseases in the children under the age of five years was observed due to the introduction of thirteen valent vaccine which offered immunity against major stereotypes of streptococcus pneumonia.⁶ In a similar manner, a substantial decline in the hospital admissions i.e. 77,000 cases only in the USA, due to diarrhea have been recorded by the use of Rota Virus vaccine in young children which saved 242 million dollars.⁷

According to the UNICEF (United Nations International Children's Emergency Fund), approximately 2 to 3 million children die every year globally from infectious diseases which can easily be prevented by vaccination; out of which, the majority of these causalities are reported from developing countries.^{8,9} The overall infectious disease burden among children and consequent loss of precious lives is substantial. The immunization is an effective and efficient public health intervention which may help to prevent children from acquiring such infections and to reduce the economic burden of disease, morbidities and mortalities.^{10,11}

In 1974, EPI (Extended Program for Immunization) was one of the major initiatives taken by the WHO (World Health

Organization) to vaccinate children all over the world against the seven vaccine-preventable diseases under one year of age including pertussis, poliomyelitis, diphtheria, childhood tuberculosis, measles, hepatitis B and neonatal tetanus.⁶ This basic package of vaccination was further enhanced and regularly reviewed to ensure the effectiveness of the initiative. Later on, more vaccines were also added e.g., pentavalent etc. to cope with the emergence of new threats and epidemics.¹²

Table: 1 Routine Immunization According to WHO

Name of vaccine	No. of doses(Extended Program of Immunization)	Age of administration
BCG	1	At birth
Trivalent OPV	4	At birth, 6, 10 and 14 weeks
Measles	2	At 9 month and 2nd year of life
Pentavalent (DPT-Hepatitis B)	3	At 6,10 and 14 weeks
DPT	3	6.10 and 14 Weeks of Birth

According to an estimate, 116 million children were vaccinated only against diphtheria, tetanus and pertussis (DTP) for the year 2018, globally.⁸ During the last two decades, 21.1 million worldwide deaths were prevented merely by vaccinating children against measles and reducing approximately 80% of children deaths.⁷ In the US, 42,000 infants' lives were saved, 20 million cases of infections were prevented, and US\$ 13.5 billion treatment cost and US\$ 68.8 billion societal costs were saved in 2009.¹³

Table: 2 Reduction in Diseases in Developed World due to Vaccination

Name of vaccine	No. of doses
Diphtheria	100%
Measles	99.9%
Paralytic Poliomyelitis	100%
Rubella	99.9%

Congenital Rubella Syndrome	99.3%
Smallpox	100%
Mumps	95.9%
Tetanus	92.9%
Pertussis	92.2%

Global statuses of vaccination coverage and immunization rates have been improved but still more sustainable efforts are needed. According to an estimate, 19.4 million children of less than 12 months of age had not received three recommended doses of DTP in the year 2018, worldwide.¹⁴ Moreover, 13.5 million children of the same age group had not been immunized completely for any infectious disease listed in the basic package of vaccination.¹⁵ Another problem occurs when children receive their first dose of vaccine but missed their booster doses and left their routine course of vaccination incomplete, hence, affect the global coverage of immunization.¹⁶ This implies that vaccine hesitancy has also known as anti-vaccination and its low coverage is not just a regional issue but termed as a global phenomenon.¹⁷

MATERIAL AND METHODS:

The design of this study was a Community based Cross-sectional study. The study was conducted in fifteen UCs (Union Councils) of Tehsil Kot Addu, District Muzaffargarh including Pattal Munda, 632 TDA, Budh, 565 TDA, Daira Din Panah, Ehsan Pur, Hanjrai, Doger Klasra, Allurid, Mahmood Kot, Chowk Sarwar Shaheed Urban, Sheikh Umer, 547 TDA, Qasba Gujrat and Wandhar. Also, one Primary school was included in UC Chowk Sarwar Shaheed Urban. This study was conducted for a period of nine months after the approval of the synopsis.

Sample Size: The sample size for this study was calculated by using the appropriate sample size calculation formula, used for a cross-sectional study. The sample size was estimated using the following formula:

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 p(1-p)}{d^2}$$

Where

n is the minimum sample size

Z is the standard normal deviate at 95% confidence interval (1.96), so $Z_{1-\alpha/2}^2 = 1.96^2$

P = Anticipated proportion of non-immunized children under 2 years of age = 22%¹⁸

q = the complementary probability (1 - p),

d = the precision of the study set at 0.05.

Sample size (n) calculated was 264 mothers (caregivers).

Multi-stage simple random sampling was used for the study. Tehsil Kot Addu was selected out of four Tehsils in Muzaffargarh district, through simple random sampling using a 'lottery' method. The cluster of 15UCs was selected by rendering simple random sampling from 28 UCs of Tehsil Kot Addu. From each UC, eighteen households were selected, using the bottleneck method. So, in all 15 UCs, 270 households were selected. Households with children between eighteen to twenty-four months of age and Mothers/Caregivers with age between twenty to fifty years were included in the study. One Primary School in UC Chowk Sarwar Shaheed Urban was also sampled. Individuals not willing to participate were excluded from the study. All households having consented Mothers/Caregivers with age between twenty to fifty years and Only those households having at least one child in the age bracket of eighteen to twenty-four months who are not fully immunized included in the study. All households having fully immunized children mothers or caregivers, Households which do not have any child in the age bracket of eighteen to 24 months and Households which do not give consent to provide information and Children suffering from chronic diseases or immune-compromised children taking anti-cancer drugs excluded from the study.

Table showed that 17 households were selected from each UC except for the Chowk Sarwar Shaheed Urban from where 26 households were recruited for the interview.

Details of UCs

Name of UC	Frequency (%)
Pattal Munda	17(6.40)
632 TDA	17(6.40)
Budh, 565 TDA	17(6.40)

Daira Din Panah	17(6.40)
Ehsan Pur	17(6.40)
Hanjrai	17(6.40)
Doger Klasra	17(6.40)
Allurid	17(6.40)
Mahmood Kot	17(6.40)
Chowk Sarwar Shaheed Urban	26(9.80)
Sheikh Umer	17(6.40)
547 TDA	17(6.40)
Qasba Gujrat	17(6.40)
Wandhar	17(6.40)
565 TDA	17(6.40)

Table 4 showed the demographic profile of respondents including age and education. The average age of respondents was 32.45 years (ranged from 20 to 50 years).

Demographic Profile of Respondents (N = 264)

Description	Mean±SD	Median(IQR)
Age (years)	32.45±7.42	31.00(11.75)
Education (years)	5.27±5.57	5.00(10.00)

Table 5 showed the demographic profile of respondents. Respondents stated the monthly family income of amounted to PKR 20,000 (IQR = 18,750). On average, families had 5.38 persons with a nearly equal proportion of male and female i.e., 2.64 and 2.75 persons per house each, respectively. The table further corroborates that the proportion of male and female child under the age of 2 years was also nearly the same i.e., 0.53 and 0.56, respectively. Moreover, families reported the years of living in the house up to 19.50 years.

Demographic Profile of the Targeted Households (N = 264)

Description	Mean±SD	Median (IQR)
Family income (in PKR)	37630.68±80425.09	20000(18750)
Persons living in the family	5.38±2.50	5.00(3.00)
Males living in the family	2.64±1.39	2.00(1.00)

Females living in the family	2.75±1.54	3.00(2.00)
Children <2 years of age in the family	1.09±0.28	1.00(0.00)
Male children <2 years of age in the family	0.53±0.54	1.00(1.00)
Female children <2 years of age in the family	0.56±0.57	1.00(1.00)
No. of years of residence in the house	19.50±10.49	18.50(18.00)

Table 6 showed the demographic information of targeted households. The table elucidated that majority of the households were located in the village areas (81.40%) followed by city (14.40%) and town (4.20%). Most of the father's occupation of children under the age of 2 years was a farmer (36.40%) and labour (26.50%). On the other hand, the major proportion of mothers of children under the age of 2 years were housewives (95.80%).

Demographic Information of the Targeted Households (N = 264)

Description		Frequencies(%)
Community location	<i>City</i>	38(14.40)
	<i>Town</i>	11(4.20)
	<i>Village</i>	215(81.40)
Religion	<i>Islam</i>	264(100.00)
Family type	<i>Joint</i>	24(9.10)
	<i>Nuclear</i>	240(90.90)
Occupation of father	<i>Architect</i>	10(3.80)
	<i>Army officer</i>	2(0.80)
	<i>Banker</i>	1(0.40)
	<i>Business</i>	1(0.40)
	<i>Carpenter</i>	1(0.40)
	<i>Contractor</i>	1(0.40)
	<i>Dispenser</i>	2(0.80)
	<i>Doctor</i>	5(1.90)
	<i>Driver</i>	3(1.10)
	<i>Veterinary Assistant</i>	1(0.40)
	<i>Farmer</i>	96(36.40)

	<i>Government officer</i>	5(1.90)
	<i>Laborer</i>	70(26.50)
	<i>Lawyer</i>	2(0.80)
	<i>Mechanic</i>	6(2.30)
	<i>Private job</i>	19(7.20)
	<i>Private teacher</i>	1(0.40)
	<i>Professor</i>	1(0.40)
	<i>Unemployed</i>	2(0.80)
	<i>School owner</i>	2(0.80)
	<i>Shoemaker</i>	1(0.40)
	<i>Shopkeeper</i>	20(7.60)
	<i>Tailor</i>	1(0.40)
	<i>Teacher</i>	11(4.20)
Occupation of mother	<i>Doctor</i>	2(0.80)
	<i>Health worker</i>	1(0.40)
	<i>House based job</i>	1(0.40)
	<i>Housewife</i>	253(95.80)
	<i>Teacher</i>	1(0.40)
	<i>Principal</i>	1(0.40)
	<i>Private domestic shop</i>	1(0.40)
	<i>Social Worker</i>	3(1.10)
	<i>Student</i>	1(0.40)

Barriers to routine immunization faced by Parents/caregivers

Description	Yes (%)	Partially(%)
Influenced by in-laws for not vaccinating your children	119(45.10)	6(2.30)
Influenced by the neighbors for not vaccinating your children	103(39.00)	2(0.80)
Influenced by your employer for not vaccinating your children	92(34.80)	3(1.10)
Any financial issues for vaccinating your children	82(31.10)	6(2.30)
Travel required to far off areas for vaccinating your child	91(34.50)	14(5.30)
Health facilities have stock-outs of the vaccine	96(36.40)	15(5.70)

Health facilities have unavailability of qualified staff for vaccination	68(25.80)	13(4.90)
Doubt the competency of vaccination staff	76(28.80)	12(4.50)
Ever heard any religious scholar speaking against vaccination	74(28.00)	9(3.40)
Ever heard any political figure speaking against vaccination	82(31.10)	1(0.40)
Fear of peers for not vaccinating your children	97(36.70)	3(1.10)
Ever been threatened by any peer for vaccinating your children	101(38.30)	4(1.50)
Fear of neighbors for not vaccinating your children	82(31.10)	1(0.40)
Ever been threatened by your neighbors for vaccinating your children	74(28.00)	1(0.40)
Fear of employer for not vaccinating your children	66(25.00)	1(0.40)
Ever been threatened by your employer for vaccinating your children	71(26.90)	0(0.00)
Fear of religious leader for not vaccinating your children	79(29.90)	6(2.30)

Table elucidated barriers to routine immunization faced by parents/caregivers. A significant proportion of the respondents stated that they were influenced by in-laws (45.10%), neighbors (39%), or employer (34.80%) for not vaccinating their children. Nearly, one-third of respondents (31.10%) stated that they were facing financial issues while 3.80% of respondents were facing financial issues partially. Transport was another barrier faced by respondents (34.50%) to get their children vaccinated. Similarly, other reported barriers include stock-outs of the vaccine (36.40%), unavailability of qualified staff for vaccination (25.80%) and doubt on the competency of vaccination staff (28.80%). The table further delineated that a sizable number of parents/caregivers witnessed speech against vaccinations by religious scholars (28%) and public figures (31.10%). Threats and fear were among other factors which were reported by the respondents as depicted in the table.

Immunization Status of Children

Immunization Status	Frequency (%)
Fully immunized child	178(67.40)
Partially immunized child	68(25.80)
Non-immunized child	18(6.80)

Table showed that the majority of children (67.40%) were fully immunized followed by partially immunized children (25.80%) and non-immunized children (6.80%).

Association between immunization status of a child and demographic factors, calculated by Chi-square test

Socio-demographic Factors	Immunization status of a child		p-value
	Fully immunized child <i>n</i> (%)	Not fully immunized child <i>n</i> (%)	
Community location			
City/Town	31(63.30)	18(36.70)	0.299
Village	147(68.40)	68(31.60)	
Family type			
Joint	13(54.20)	11(45.80)	0.112
Nuclear	165(68.80)	75(31.30)	
Occupation of Mother			
Housewife	6(54.50)	5(45.50)	0.267
Working Woman	172(68.00)	81(32.00)	

Table showed the association between immunization status of a child (fully immunized child, not fully immunized child) and demographic factors including community location (city/town, village), family type (joint, nuclear) and occupation of the

mother (housewife, working woman). The results showed that the immunization status of a child was not significantly associated with community location ($p = 0.299$), family type ($p = 0.112$) and occupation of the mother ($p = 0.267$).

Discussion:

This study was conducted for a period of four months to assess barriers associated with immunization of children under the age of two years living in 15 different Union Councils of Southern Punjab in Pakistan. Data was collected from more than two hundred individuals to assess knowledge, attitude, and perceptions of the mothers/caregivers regarding immunization and potential barriers associated with it. The area targeted for the study covered rural, semi-urban, and urban localities and the participants of the study included parents and caregivers from a diversified background in terms of their sociodemographic parameters including age, educational qualifications, working status and family income; socioeconomics, sociocultural and religious believes. Therefore, the data collected contained perceptions of a larger and diversified group which is a potential strength of the study. Whereas the study only includes routine childhood and immunization and does not take into consideration other immunization rates and coverages among children and adults, limits the scope of the study.

The figure escalated to 86.5% in the mothers belonging to the urban areas. The results are also in line with another study conducted in Egypt with the same aim and revealed that 31.2% percent of the mothers had moderate knowledge; and 70% of the mothers had good attitude score concerning childhood immunization.¹⁹ Another study conducted in Saudi Arabia highlights the same results and revealed that parents had a

significantly high level of knowledge about the routine vaccination of children.²⁰

Most of the parents and caregivers participated in the study had a positive attitude towards immunization and immunization of their children. This can be associated with the level of knowledge of the mother and caregivers, which ultimately impacts their attitude and practices regarding immunization.²¹ This is

consistent with an Arabian study targeting parent to identify knowledge, attitude, and practices of parents regarding vaccination of children; reported that majority of the parent had a sound positive attitude towards immunization of their children.²¹

A local study conducted in Karachi city targeted rural or underdeveloped communities and revealed that mothers had limited knowledge about immunization, but better vaccination rates and both of the parents of a child showed a very positive attitude towards vaccination of their children.²² A Nigerian study highlighted the statistically significant positive attitude of the parents and stated that about 82.3% were willing to vaccinate their children against infectious diseases.²³

As per the findings of the study, a good percentage of the children are vaccinated as compared to partially vaccinated or non-vaccinated children against childhood vaccine-preventable infectious diseases through routine immunization services. A study conducted in India assessed immunization rates in rural and urban populations and revealed that only 30.5% of the children were partially vaccinated and the rest were completely vaccinated for all childhood infection as per the schedule of immunization, regardless socioeconomics, and sociodemographic profile of the families.²⁴ The same results were shown by a study conducted in Ethiopia, that 61% of children up to 24 months of age were completely vaccinated for all the diseases in the immunization schedule followed by partially vaccinated and non-vaccinated children. The results of this study are also consistent with a study, conducted in Togo city Africa, stating that only 61% of the children are completely vaccinated, which is inadequate vaccine coverage, but the percentage is better as compared to the incompletely vaccinated and non-vaccinated children in the area.¹²⁵

REFERENCES

1. Alici DE, Sayiner A, Unal S. Barriers to adult immunization and solutions: Personalized approaches. *Human vaccines & immunotherapeutics*. 2017, 2;13(1):213-5.
2. Kao CM, Schneyer RJ, Bocchini JA. Child and adolescent immunizations: selected review of recent U.S. recommendations and literature. *Curr Opin Pediatr*. 2014;26(3):383-395
3. Temoka E. Becoming a vaccine champion: evidence-based interventions to address the challenges of vaccination. *SD Med*. 2013:68-72
4. Esposito S, Durando P, Bosis S, et al. Vaccine-preventable diseases: from paediatric to adult targets. *Eur J Intern Med*. 2014;25(3):203-212.
5. Bonanni P, Santos JI. Vaccine evolution. *Perspectives in Vaccinology*. 2011 Aug 1;1(1):1-24.
6. Khabbaz RF, Moseley RR, Steiner RJ, et al. Challenges of infectious diseases in the U.S.A. *Lancet*. 2014;384(9937):53-63
7. Sharts-Hopko NC. Issues in pediatric immunization. *MCN Am J Matern Child Nurs*. 2009;34(2):80-88
8. Immunization. United Nations International Children's Emergency Fund, 2020. Available at: <https://www.unicef.org/immunization>
9. Children: Reducing Mortality. World Health Organization, Geneva, Switzerland, 2017. Available at: <https://www.who.int/en/news-room/fact-sheets/detail/children-reducing-mortality>
10. Singh S, Sahu D, Agrawal A, Vashi MD. Barriers and opportunities for improving childhood immunization coverage in slums: A qualitative study. *Preventive medicine reports*. 2019;6;14:100858.
11. Zhou F, Santoli J, Messonnier ML, Yusuf HR, Shefer A, Chu SY, Rodewald L, Harpaz R. Economic evaluation of the 7-vaccine routine childhood immunization schedule in the United States, 2001. *Archives of pediatrics & adolescent medicine*. 2005;12 1;159(12):1136-44.
12. Peck M, Gacic-Dobo M, Diallo MS, Nedelec Y, Sodha SS, Wallace AS. Global Routine Vaccination Coverage, 2018. *Morbidity and Mortality Weekly Report*. 2019 10;68(42):937.
13. Child Health: Immunization. United Nations International Children's Emergency Fund, 2020. Available at: <https://data.unicef.org/topic/child-health/immunization/>
14. Zhou F, Shefer A, Wenger J, Messonnier M, Wang LY, Lopez A, Moore M, Murphy TV, Cortese M, Rodewald L. Economic evaluation of the routine childhood immunization program in the United States, 2009. *Pediatrics*. 2014;4;133(4):577-85.

15. Macintosh JL, Eden LM, Luthy KE, Schouten AE. Global Immunizations: Health Promotion and Disease Prevention Worldwide. *MCN: The American Journal of Maternal/Child Nursing*. 2017;5;42(3):139-45.
16. Peck M, Gacic-Dobo M, Diallo MS, Nedelec Y, Sodha SS, Wallace AS. Global Routine Vaccination Coverage, 2018. *Morbidity and Mortality Weekly Report*. 2019;10;68(42):937.
17. Sodha SV, Dietz V. Strengthening routine immunization systems to improve global vaccination coverage. *British Medical Bulletin*. 2015, 1;113(1):5-14.
18. Bugvi AS, Rahat R, Zakar R, et al. Factors associated with non-utilization of child immunization in Pakistan. Evidence from the Demographic and Health Survey 2006-07. *BMC Public Health*: 2014, 12; 14:232.
19. Ramadan, H. A., Soliman, S. M., & El-Kader, R. G. (2016). Knowledge, attitude and practice of mothers toward children's obligatory vaccination. *Journal of Nursing and health science*, 5(4), 22-28.
20. Saleh A, Alrashidi AA, Bukhari MA, Habib RF, Alsubhi RA, Saadawi DW, Hatim RF. Assessment of knowledge, attitude and practice of parents towards immunization of children in Saudi Arabia, 2018. *The Egyptian Journal of Hospital Medicine*. 2018 Apr 1;71(2):2585-9.
21. Yousif M, Albarraq A, Abdallah M, Elbur A. Parents' knowledge and attitudes on childhood immunization, Taif, Saudi Arabia. *J Vaccines Vaccin*. 2013 Dec;5(215):2.
22. Al-Zahrani J. Knowledge, attitude and practice of parents towards childhood vaccination. *Majmaah Journal of Health Sciences*. 2013;1(1):23-32.
23. Nisar, N., Mirza, M., & Qadri, M. H. (2010). Knowledge, Attitude and Practices of mothers regarding immunization of one year old child at Mawatch Goth, Kemari Town, Karachi. *Pak J Med Sci*, 26(1), 183-186.
24. Agboola, S. M., Busari, O. A., Segun-Agboola, B. T., Olajide, T. J., Shabi, O. M., & Elegbede, O. T. (2015). Knowledge, attitude, perceptions of adult males towards childhood immunizations in southwest Nigeria. *American Journal of Health Research*, 3(1), 1-5.
25. Mugada, V., Chandrabhotla, S., Kaja, D. S., & Machara, S. G. K. (2017). Knowledge towards childhood immunization among mothers & reasons for incomplete immunization. *J App Pharm Sci*, 7(10), 157-61.

AUTHORS

First Author – Dr. Syed Razi Abbas, MBBS, M.Phil. (Public Health) Lucky Core Industries Limited,

Second Author – Dr. Ahmad Bilal Ashraf, MBBS,

Third Author – Dr. Hamza Qadir, MBBS,

Correspondence Author – Dr. Syed Razi Abbas, MBBS, M.Phil. (Public Health) Lucky Core Industries Limited,